AMERICAN BEE JOURNAL

Vol. LXXV—No. 2 Hamilton, Illinois, February, 1935 Monthly, $1.00 a Year

Airplane Dusting and Its Relation to Beekeeping

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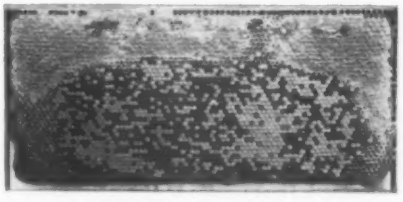
Illustrating the manner in which poisonous dusts are applied by airplane to citrus trees. (Through the courtesy of the Hawke Dusters.)

THE Agricultural Census Reports of the United States indicate a loss of 1,000,000 colonies of bees on farms between 1900 and 1930. This decline is due to many causes, chief among which is undoubtedly the increased use of spray materials and chemical dusts in the control of insect pests. The recent use of the airplane as an applicator of chemical dusts has greatly increased the hazards of beekeeping in many regions because of the great amount of drift of the poisons that it invariably produces. Commercial beekeeping interests have suffered losses that may even exceed those of the farmer beekeeper. In the Imperial Valley of California, over 3000 colonies of bees have been killed by dusting during the past four years and as many more colonies have been so reduced in strength as to make them unprofitable for weeks thereafter and often for the balance of the season. Livestock have also been killed by the poisons drifting over their pastures. Webster of Washington reports the destruction by spray poisoning of over 2000 colonies of bees during 1933 in the Yakima Valley and the loss of over 600,000 pounds of honey. It is evident, therefore, that unless some steps are taken to prevent or to mitigate these injuries, beekeeping will be a thing of the past in many regions in which these practices are fast becoming established. It is even now very doubtful if farmers ever again will be able to keep small apiaries in those regions in which spraying and dusting is most prevalent.



A frame of brood from a colony injured by airplane dusting. All unsealed brood disappeared within a few days after the calcium arsenate had been applied.

The drift of the calcium arsenate as it appeared more than a quarter of a mile from the area over which application by airplane had been made. In this instance the drift was quite noticeable after it had traveled 3 miles.

Will Airplane Dusting Become a General Practice?

Although still in the pioneering stage, the airplane has been used to apply liquid sprays as well as dusts. Less damage to bees and livestock results when liquid sprays are applied because there is less drift from the fields to which applications are made. Besides its use in applying liquid sprays, the airplane has been used to apply such chemical dusts as cyanogas, calcium arsenate, fluosilicates, sulphur, and nicodusts, as well as other poisons. It is being used to dust forest and shade trees, deciduous fruit trees, citrus groves, walnut trees, vineyards, and such crops as beans, peas, tomatoes, lettuce, potatoes, asparagus, carrots, cucumbers, melons, and cantaloupes. It has been

The location of the apiaries in relation to the tomato fields that were dusted with calcium arsenate by airplane in the vicinity of Davis, California. The destruction of colonies caused by the drift of the poisons over adjacent territory is described in the text.

used to broadcast poisoned bran mash in the control of grasshoppers and arsenical dusts in the control of anopheline mosquitoes. In practically every case where the airplane is used to apply a chemical dust, the dusts are scattered by the winds to a vast acreage beyond the area treated and this deposit in turn forms the potential source of death to bees and livestock. The beekeeping industry is unable to sustain these serious losses from this chemical warfare that is being waged against insects, and still greater losses will result if the airplane is used more generally than now to apply chemical dusts.

A Specific Example of Bee Poisoning

During the summer of 1934 an airplane company treated approximately 300 acres of tomatoes with calcium arsenate dust in the vicinity of Davis, California. Three apiaries of considerable importance were located in this area as well as several other colonies belonging to beekeeping enthusiasts. The net result to the apiaries of four dust applications, each field was dusted on an average of three times during the summer, was the practical destruction of all but 8 colonies and three nuclei in one apiary that originally consisted of 54 colonies and 65 three-frame nuclei, ten colonies died in the second apiary and the remaining colonies were greatly reduced in strength, while in the third apiary 102 colonies out of 112 were lost. The monetary loss to these apiaries was estimated, conservatively, at $1,590.00. Four "invasions" in all were made between July 25 and August 31, after which the "siege," as it appeared to the beekeepers in the vicinity, was lifted. Out of this wholesale destruction some definite records were taken that might prove of value to other beekeepers.

Symptoms of Arsenical Dust Poisoning

An abnormal death rate of bees was noticed within a few hours after the first dusts were applied. By the second day, the apiary was literally carpeted with dead, crawling, and hopping bees. After the second day, the number of dead and crawling bees found outside the hives decreased markedly, due primarily to the fact that between 60 and 75 per cent of the colony force had disappeared during the first two days. This sudden decrease in the strength of the colony is one of the important symptoms of spray poisoning. The strength of the colonies continued to decline for weeks evidently in proportion to the amount of arsenic that had been stored in the combs with the pollen, until some of the colonies died out completely. In some cases the last few hundred bees swarmed out with the queen and in these instances many bees left the hive that were too young to fly and crawled aimlessly about on the ground to finally gather in small groups. A majority of the unsealed brood disappeared, leaving only eggs and sealed brood. Many of the emerging bees died in their cells, generally with their tongues extended and numerous cells were also observed with dark mummified pupae.

The activities of individual bees affected by arsenical poisoning is somewhat characteristic. When the symptoms are severe, one will see thousands of bees running about on the ground, unable to fly for more than a few inches or a few feet at a time. Their activities increase with an increase in temperature and their aimless movements generally carry them out of the apiary to be lost in the grass and weeds. Where the ground is plowed or quite dusty, several hundred bees may be found in depressions but as a rule large numbers of dead are not found in front of the hives as is the case in buckeye or other plant poisoning. A stupor and partial paralysis finally overcome them and many die with their tongues fully extended. Some writhe about on their sides or buzz around on the ground in short circles before dying. When some of the crawling bees were caged and given sugar syrup, many lived until the following day, thus indicating that those that are only slightly affected with the arsenic leave the hive and die of starvation and exposure or suffocate if dust particles close their spiracles. The frantic buzzing of the affected bees on the ground may be due to the latter cause rather than to a direct effect of the arsenic itself.

In all hives in the apiaries in which colonies were destroyed by this poisoning, the queens lived to the very last. The fact that the queen receives much the same food as the younger larvae and that this food is elaborated by the nurse bees, lends support to our belief that the nurse bees leave the hive to die before they feed the larvae or queen food that they have attempted to elaborate from poisoned pollen. The larvae then must die of starvation and exposure. This is borne out further by our finding many larvae in a starving condition within a few days after the external symptoms of injury from spray poisoning were observed. The majority of the larvae were later removed by the bees although some dried down while others decomposed before their removal. The brood combs under these conditions had the gross appearance of those in a colony badly infected with European foulbrood. Many of the combs of brood bore a resemblance to buckeye poisoning.

Although even a large quantity of arsenic does not kill the honeybee immediately, it does affect the bee in such a way as to cause a stupor and also a partial paralysis of the wing muscles. For this reason, the nectar gatherers as a rule die in the field before they are able to return to their hives. Arsenic also causes in bees a symptom quite similar to dysentery and under such a stimulation, the bee's first response is to leave the hive, or if outside, to remain there, in order to free its alimentary tract of the toxic materials. It is to be expected, therefore, that little if any of the poisoned nectar they gather is ever deposited in the combs and this proved to be the case in our

present experience. Honey that was extracted from the brood combs of colonies killed by the poison did not kill bees when fed to them while they were confined to cages.

The Calcium Arsenate Drifted for Great Distances

Analyses of samples of alfalfa, star thistle, mustard, and morning glory blossoms collected outside the fields dusted revealed the presence of many times the lethal dose of arsenic for bees, one sample of star thistle collected three-fourths of a mile away from a treated field containing 38 times more arsenic than was necessary to kill a bee and the sample contained fewer blossoms than is necessary for a bee to visit in order to secure a load of either pollen or nectar. Other samples contained as much as 3,535 parts of arsenic per million and one-half part per million of arsenic will kill a bee. Analyses of crawling bees, of dead bees and of pollen from combs, and of pollen collected from bees at the entrance of hives showed the presence of large amounts of arsenic in each sample. Vaselined glass plates that were placed at intervals up to 440 yards from a field in the line of the drifting dust indicated that a very appreciable amount of the total portion applied had drifted from the field. In one case, the drift was observed for a distance of at least three miles beyond the field treated.

An analysis of the amounts of calcium arsenate collected on the vaselined plates was quite interesting. Approximately 12 pounds of the dust containing 70 per cent calcium arsenate was applied to the acre. If this amount was spread evenly over an acre, approximately 86.2 milligrams of arsenic would be applied per square foot. The eight 5x7 glass plates that were placed in the field indicated a spread of 33.5 milligrams of calcium arsenate per square foot while the 18x30 inch glass plates that were located at distances of 20, 70,120, 170 and 440 yards from the field indicated deposits of 5.86, 5.30, 3.73, 4.26, and 1.33 milligrams of calcium arsenate, respectively. This gives definite evidence that a large portion of the total amount of dust applied drifted from the field being treated.

Some Preventive and Remedial Measures

In the present instance, when bees were not attracted to tomato blossoms in the field, it was evident that the injury to bees from the application of calcium arsenate to the tomato fields would have been negligible **had the dust been confined to the fields treated.** This had been demonstrated in the past since for three years a 50-acre field had been planted to tomatoes across the road from the apiary in which the greatest destruction of colonies occurred and although it had been dusted heavily each year by hand machines, no loss of bees had occurred. Clean cultivation to remove any weeds that may attract bees to the fields dusted would further reduce the possibility of injury to bees.

When fields are dusted that contain plants that are attractive to the bees, such as beans, peas, alfalfa, melons, etc., or cover crops in bloom in an orchard, the beekeeper should be notified in advance and should move in order to avoid injury to his colonies. However, if the dusts are confined to the fields treated, the injury to bees is far less even when bees are attracted to such fields than when the dusts are broadcast in such a way as to promote their drift to adjoining territory. Since bees may fly in a radius of 2.5 miles from their hive in search of nectar and pollen, and often fly farther than that when no intervening source of food is available, colonies should be moved several miles away from the treated fields in order to avoid injury. This works a distinct hardship on the beekeeper since the dusting of even a relatively small field by airplane during which the dust drifts to adjoining fields, practically makes the entire area a closed territory as far as the beekeeper is concerned.

It is evident that combs should be freed of poisoned pollen before they are used again. This can be done by soaking the combs in water for 48 hours after which the pollen shrinks sufficiently upon drying to permit the bees to remove it from the cells.

Confining the bees to their hives during the spraying operations for as long as possible and for several days thereafter, tends to mitigate the injury but will not prevent a major destruction of bees. Removing the colonies from the region before the dusts are applied and for at least a week thereafter will prevent the loss of bees.

It is hardly within the province of this article to touch further on the means of combating this growing menace to the beekeeping industry. The fruit and vegetable grower has a right to protect his crop from the depredations of injurious insects and I am sure that none of them would willingly destroy their good friend, the honeybee. Whenever possible, therefore, the grower should cooperate with the beekeeper not only by abiding by spray schedules that will minimize the injury to pollinizing insects but also should notify the beekeeper when he has to dust or spray crops in bloom. A registration of the location of apiaries with the county agricultural commissioner will enable him to notify the beekeepers of the dusting or spraying program for the season. The beekeeper also should acquaint himself with the insect control program of the vicinity in which his bees are located and be prepared to move his colonies if they are endangered by the application of chemical dusts or by spray poisoning. It costs to move bees and suitable locations are not always available on short notice but it is better to move and lose a portion of a honey crop than it is to lose both honey crop and bees.

This suggestion for moving applies, primarily, when dusts or liquid sprays are applied in such a manner as to confine the materials to the crops being treated and when the bees are attracted to the fields by the blossoms therein. However, the beekeeper should not be forced to tolerate the greater losses which generally result when the poisonous materials are applied in such a way that they cannot be confined to the fields for which they are intended but are permitted to drift to poison vegetation in adjacent fields. Such drift always occurs with airplane dusting. In such cases the beekeeper should insist that such practices cease **or that those responsible for the applications carry sufficient insurance to cover the damage to life and property that may result therefrom.** In most states existing laws are sufficient to protect the beekeeper and livestock raiser from the promiscuous spreading of poisons and the beekeeper and livestock men can well cooperate in seeing that these laws are enforced.

The value of the honeybee as a pollinator has been conservatively estimated as ten times that of the value of the honey and wax it produces. The farmer and average citizen is the recipient of this service and should be very much interested in preventing any practice that will destroy it. The honeybee is the only insect that can be raised and moved in sufficient numbers for pollinating purposes and when it is destroyed, not only the yield but also the quality of the products produced by cross pollination are greatly reduced if not entirely destroyed.

Our Covers for 1935

You will note the new cover design in this issue still retains the idea of the 75th volume, continuing our anniversary year. We have had many comments of appreciation about the January number. We hope to have some interesting historical material in each issue for the year, and we invite criticism anytime.

The picture on the center of the new cover is intended to be changed each month and to illustrate some of the intimate details of colony life. We hope you'll like them. The picture needs no explanation. It is a fine picture of a ripe queen cell and was taken by our Field Editor, Frank C. Pellett. It appears in his book, "Romance of the Hive," published by the Abingdon Press, New York.

The Crating of Package Bees*

By Warren Whitcomb, Jr.

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PRELIMINARY studies of the causes of loss of bees during shipment indicate that ventilation is extremely important. From the data available it seems evident that a large portion of the loss of bees during shipment is caused by the two factors high temperature and inadequate ventilation. Bees seem to be able to withstand high temperature provided ventilation is ample, but they die rapidly during periods of high temperature if the ventilation is cut off.

At the present time there is little variation in the sizes of cages used for shipping bees. There are two sizes of the two-pound cages, 16"x9" x4½" and 12"x9"x6", and two sizes of the three-pound cages, 16"x9"x 5½" and 16"x9"x6", and these four cage sizes perhaps carry 95 per cent of the total volume of bees shipped.

*A contribution from the Southern States Bee Culture Field Laboratory, Baton Rouge, La., maintained by the Division of Bee Culture, Bureau of Entomology and Plant Quarantine, United States Department of Agriculture, in cooperation with Louisiana State University.

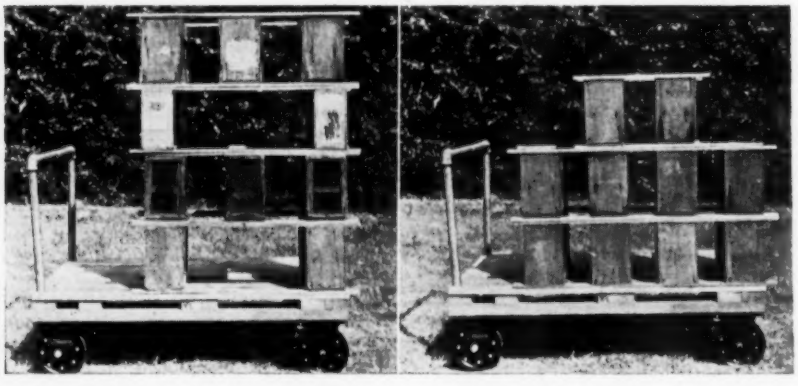


Figure 1 (left above) showing 10 cages of bees, of various types, crated according to the recommendations given in Circular E-287. This method of crating allows ample ventilation.

Figure 2 (right above) showing 10 cages crated in 4-cage crates. Two packages must be crated alone. As shown, ventilation is not cut off, but under actual shipping conditions the top crate may be jarred out of place and cut off a good part of the ventilation.

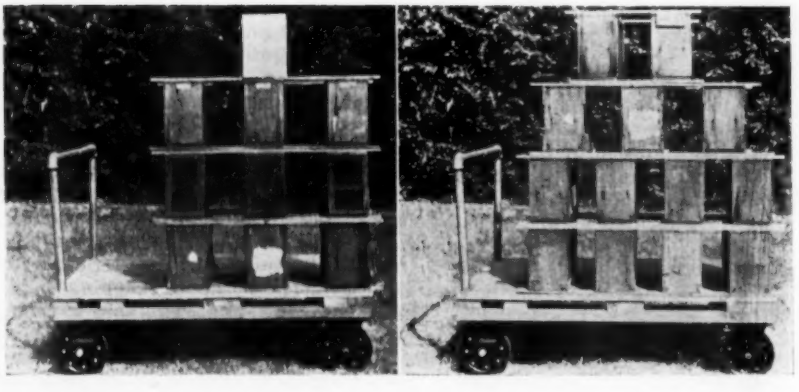


Figure 3 (left, below) showing 10 cages crated in 3-cage crates but not according to recommendations in Circular E-287. This is a common method of crating but has no advantages over the 4-cage crate method shown in Figure 2. Compare this figure with Figure 1.

Figure 4 (right, below) this arrangement may happen when the 3-cage and 4-cage types of crates are stacked together in an express car during actual shipment. A beekeeper would see that only the top crate can receive good ventilation.

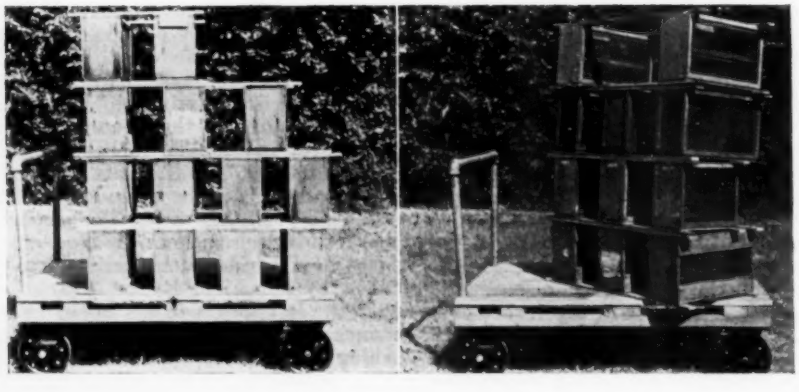


Figure 5 (left) showing the same cages as Figure 4, but stacked to give the best possible ventilation. Notice that one cage of the 3-cage crate is cutting off the ventilation of two packages of the 4-cage crate below it.

Figure 6 (right) even with the recommended crating, this unstable type of stack may happen if two sizes of cages are stacked in the same tier. Compare with Figure 1.

There is ample justification for recommending one size of cage, 16" x9"x6", for both two-pound and three-pound shipments.

Under present-day conditions there is more variation in methods of crating and sizes of crates than in sizes of packages. Crating of packages has been largely a matter of convenience to the shipper and the crating materials used have been mostly waste strips from the process of cage manufacture. Under such conditions an order for ten packages of bees might be shipped: (1) As two crates of four packages and one crate of two packages (Fig. 2), (2) as three crates of three packages with one odd package (Fig. 3), (3) as five crates of two packages, (4) as two crates of five packages, and possibly (5) as two crates of three packages and two crates of two packages (Fig. 1).

During the rush of the shipping season a messenger on an express car who receives fifty packages of bees may receive five shipments of ten packages, each shipment crated in a different manner. It is easy to see, with such a conglomeration of crates, that some packages are likely to be poorly ventilated, since it is impossible to stack the many types of crates so as to allow full ventilation. When shipments in a single express car are heavy, conditions of temperature and ventilation become worse than those indicated above.

In Circular E-287, "Recommendations for Shipping Cages for Bees"** may be found recommendations for crating packages of bees. These recommendations were included merely as a guide to shippers and have lately been revised to further safeguard bees during shipment by providing more space between packages.

It will be seen from the "Recommendations" that any number of cages, except single cages, may be crated into either the two-cage or three-cage crates. The tabulation shown with this article will illustrate this point.

Tabulation Showing Method of Crating Packages

Number Packages to be crated	Number of Crates 3 pkg.	2 pkg.
2	0	1
3	1	0
4	0	2
5	1	1
6	2	0
7	1	2
8	2	1
9	3	0
10	2	2
11	3	1
12	4	0
15	5	0
20	6	1
25	7	2
30	10	0
40	12	2
50	16	1
100	32	2

With this size of crate and type of crating there are no odd packages in shipments of two or more packages. Single packages, however well protected by crating strips, are always a liability during shipment. With any other method of crating, odd-sized crates are unavoidable. Complete data on the number and size of 112 shipments of bees by one shipper during the 1934 season show (1) that fifty orders were for five packages or multiples of five packages (10, 20, 30, 35, 50, etc.), (2) that an additional thirty-one orders were in multiples of two or three packages, (3) that twenty-eight orders were for single packages, and (4) that four orders were for odd numbers (11, 13, 37 packages) which could have been crated in the recommended crate without odd crates. This means that this shipper, using the recommended crate, would have had only twenty-eight orders (single package orders) which could not have been crated in the recommended crate. The same shipper using the four-cage crate would have had (1) only twenty-eight orders which could be shipped in crates of four cages without odd crates; (2) forty-seven other orders that could have been shipped in crates of four packages, with sixty odd crates (nine crates of three packages, fifty-one crates of two packages) and fourteen single packages; and, (3) in addition, the twenty-eight orders for single packages.

In summary, if this shipper had used the recommended crating methods he would have shipped 604 crates of bees, which could have been crated with strips of uniform length; but with the four-cage crate, plus the necessary odd crates, he would have shipped a minimum of 468 miscellaneous crates, only 349 of which would have been four-cage crates for which he could have used uniform crating strips. Under actual shipping conditions he shipped 498 crates of bees.

The advantages of the recommended crate, not only the convenience of using uniform crating strips, but also the added ventilation provided by uniform crating, can be easily understood if we picture conditions within the express car if these 112 orders had been shipped on one day. In one case the express messenger would have received 604 uniform three-cage crates which could have been stacked to secure the maximum ventilation with the minimum of labor, time, and knowledge of bees. In the other case the messenger would have received 468 crates, but these would have been of three types (376 four-cage crates, fifty-one two-cage crates, and nine three-cage crates), which, under ordinary conditions, would have had to be rehandled during stacking so as to secure adequate ventilation, or, if stacked hurriedly, perhaps several packages would have received practically no ventilation. Under such conditions bees could be shipped without severe losses only by having the shipment accompanied by an experienced beekeeper.

Crating of packages in uniform crates as recommended, allows the standardization of crating strips and the preparation of these strips prior to the beginning of the active shipping season. The shipper must be careful however to follow the recommendations exactly if the maximum safety insurance during shipment is to be obtained. The three-cage crate as recommended is subjected to abuses and when so abused it has no practical advantage over the four-cage crate or any other method of crating. Suppose an order for ten packages of bees is received. This order would be shipped, if the recommendations are followed carefully, in four crates—two three-cage crates and two two-cage crates, (Fig. 1), which when stacked in the express car would insure the maximum ventilation. However such an order would be crated by some shippers as three three-package crates and a single package, (Fig. 3) and this method of crating, especially when such a shipment moves with other shipments, does not insure maximum ventilation any more than ten packages crated in four-package crates (i.e. two crates of four packages and one crate of two packages, as in Fig. 2) would insure maximum ventilation. In the final analysis, accidents disregarded, the shipper who pays careful attention to details is the shipper who has the smallest losses in shipment, and careful attention to crating is one of the important details.

Since adequate ventilation is vital to bees in shipment during periods of high temperature, anything which the shipper can do to insure the free circulation of air through the packages is highly important. The proper crating of packages is one method of insuring adequate ventilation, and it seems probable that a large part of the loss in shipment could be eliminated if all shippers would use one size of cage and one type of crating.

The paragraph on crating of packages in Circular E-287 has been revised as follows:

"When two or more cages are sent to the same purchaser, they should be crated together. Four crating strips each 34 inches long by not less than 1 inch wide and ⅜ inch thick should be used on each crate. Not more than three cages should be crated together. The end cages of the crate should be placed 2 inches from the ends of the crating strips and the center cage placed midway between the two end cages. If two cages are to be crated, the same length crating

(Please turn to page 80)

**Available without charge from Southern States Bee Culture Field Laboratory, University Station, Baton Rouge, Louisiana.

Overwintered Bees vs. Packages

A great many beekeepers are wondering whether it pays to winter their bees rather than to buy packages each spring. In this issue will be found the story of a Michigan beekeeper who prefers to buy packages. We anticipate that some argument will result from this story. While some beekeepers contend that it is cheaper to extract the honey in the fall and pile up the hives to be filled with bees from the South, others by no means agree.

Enough are willing to try the experiment to demonstrate its value. Time alone will tell but the result is largely in the hands of the package shippers. If the northern beekeeper can secure a dependable supply of bees at a price below what it costs him to winter his colonies, the practice will grow. If we add the value of the honey consumed in wintering to the losses of bees and cost of labor and packing, we find the figure not far from that at present charged for a package of live bees delivered in the spring.

Economy of operation must be the great objective of every beekeeper under present conditions. A good volume must be conducted at low overhead costs to enable a man to continue in any business. If prices of bees and queens are above the cost of overwintering, there will be little tendency to kill the bees in the fall to replace them with packages in the spring. The final result will be a matter of dollars and cents with the cheaper method in the lead.

Many beekeepers continue to winter because of the losses that come through supersedure of queens received in packages. While depending upon package bees for making increase they contend that too many queens fail, to justify them in placing entire dependence upon them.

So much progress has been made in the package shipping business that we have every reason to expect final solution of the one remaining problem of supersedure of queens.

More Rain

Weather reports from large areas which have recently suffered from drought are reassuring. California usually produces a big crop of honey in seasons following winter rains. Now we hear that rainfall in the Los Angeles area is the largest at this season in forty-five years. Iowa suffered severely from last summer's dry weather but has had more than usual moisture during the fall and early winter. Both Nebraska and Kansas have had more than normal rainfall for early winter which promises well for next season's crops.

Likewise Michigan, Wisconsin and Minnesota have made up a portion of last summer's deficiency with more than normal precipitation in November followed by later snows which puts the region in much better condition than last winter at this time.

While some areas still remain dry the general prospect is much improved and beekeepers feel greatly encouraged that the turn has come. While the deficit in moisture reserves has by no means been entirely supplied, recent precipitation heavier than normal for the season gives promise of improvement in the favored localities.

A Happy Occasion

It is very fitting for any industry to honor its leaders, and it was a happy occasion when at the Valdosta meeting the bee men presented a magnificent silver service to E. R. Root in token of appreciation of his long service to the beekeepers. Mr. Root has spent almost his entire lifetime in a beekeeping atmosphere and has given his entire attention to the advancement of the interest of honey production. No greater reward can come to any man than the evidence of sincere regard of his fellows and a knowledge that his efforts are appreciated by those who have profited from his labor. Too often we place our flowers on the casket of the dead instead of presenting them to the living. We extend our congratulations to E. R. Root for this happy occasion and to the beekeeping industry for the thought which made it possible.

What Is An Average Yield?

Since we hear so much of late of the big crops of honey in the sweet clover regions we lose sight of the fact that these by no means indicate an average return. In this magazine in 1898 the question was asked as to what was the average crop for a twenty-five year period. The answer from about twenty prominent beekeepers from widely separated localities from Ontario to Florida and from Vermont to Utah and California, indicated averages ranging from 25 to 100 pounds per colony. More reported forty pounds per colony as an average than any other figure but the average of all reports was slightly more than 53 pounds per colony.

It is probable that even today this figure would be about right for the entire country. Beekeepers who are able to secure 100 or more pounds per colony as an average, live in favored localities and it is in such places that the big production of the future will be centered. The man who expects to make beekeeping an exclusive business will hardly be contented to remain in a locality where small yields are the rule, unless some family consideration compels him to do so.

A Significant Meeting

The convention held at Valdosta, Georgia, in December was unusual in several respects. It was the first occasion when all three of the larger beekeeping organizations held a joint meeting and it was the first convention of national importance held in the old South. The large attendance and great interest made it the outstanding convention of beekeepers in recent years. The success of the meeting insures that similar conventions will be held in future years and it is probable that such joint meetings in southern territory will come to be regular events at stated periods. In a country as big as ours it is very difficult to bring together representatives from all sections which is a greatly to be desired objective.

A Man to Be Envied

The one thing most sought and seldom found in life is contentment. The setup of our modern civilization is not well adapted to the comfort of the individual but rather looks to the wholesale production of goods as its objective.

One of the happiest of men in the writer's recollection was one who took up beekeeping late in life. In his earlier years he led an active and strenuous life in such lines of business as lumbering and mining. When age was approaching and he no longer felt equal to the strain of business and finding that the fortune which he had pursued so assiduously had escaped him, he invested his remaining funds in a small country place and took up beekeeping.

There he found security, independence and contentment, the things most to be desired of life. Although his income was small, it was ample for the standard of living which he adopted and he usually had small sums for occasional loans to his neighbors who were operating more pretentious business undertakings.

His work was such that he was able to continue his interest and control to the end of a long life, with his modest estate providing amply for his needs. He had time for visiting with his neighbors, enjoyed the friendship of leading men of the community and was held in esteem by his fellows.

The greatest of financial success could not have added anything essential to what he had, while it might have detracted from his peace of mind. He had enough with nothing left over to worry about.

Security, independence and contentment—where else could he have found it with so modest an investment.

Bees in the Orchard

So much interest has developed in recent years in the service of the honeybee in the pollination of orchard fruits that many new observations have been recorded. It now becomes apparent that not only must bees be present in the orchard at blooming time to secure pollination but that conditions must be favorable to attract the insects. Vansell has recently made observations in California which indicate that when the sugar concentration in the flowers is below five per cent the blossoms are no longer attractive to honeybees although some other insects still visit them.

When other flowers with richer nectar are blooming at the same time the bees prefer them to the fruit bloom. Thus Vansell found the bees leaving the orchard to visit the mustard, chickweed or manzanita blossoms. In similar manner it sometimes happens that the bees are attracted to dandelion blossoms when orchards are blooming in the Middle West.

New problems are thus raised for the horticulturist who depends upon bees for pollination of his blossoms. We need to learn the environmental conditions which insure abundant nectar secretion for each of the different fruits. Investigations by our Field Editor indicate that soil influences are very important in this connection. Further study will probably show that on certain soils the blossoms yield nectar copiously while on others a scant yield is secured. Other factors such as altitude, humidity and temperature are also important.

Failure of pollination of a large portion of the strawberry bloom in the Mississippi Valley is a common complaint. In this region the bees seldom visit strawberry blossoms to any extent. It is probable that the reason is lack of abundant nectar. In some localities the honeybee is reported as visiting the strawberry blossoms eagerly and it is of importance to follow the matter to the point of securing a proper explanation of the difference in behavior.

Tragedy of the Small Town

The highly specialized development of our industrial age is playing havoc with many of our small towns. Not only is our surplus cash invested in stocks and bonds of distant enterprise but the young people are leaving for the cities to become a part of the big organizations which turn out goods.

Thus the city grows at the expense of the small community from which it sucks the life blood both of cash and the oncoming generation of young people. The old folks remain behind with their memories while they watch the home town die of dry rot. Buildings are empty and enterprise is stifled because the cream of the young blood has gone to the larger places.

No city can be self sustaining for long. Once stop the inflow of young life and raw materials and it quickly dies. The present tendency must be reversed, however, for the good of the nation. The rural communities cannot continue to live at the present rate. The tendency toward specialization has gone too far. Even beekeeping, the oldest of agricultural enterprises, tends to follow the present trend through the development of larger and larger outfits in the hands of specialists.

If our small towns would keep their surplus earnings for investment in home enterprise and offer inducements for the young folks to remain, they would quickly regain the old time prosperity. There is no merit in the large city. It prospers because of what it draws from the rural districts. It is the enterprise and the activity of the young folks which makes prosperity and these can find an outlet with proper encouragement in the small town as well as in the larger one.

New Honey Plants

That there is much interest in new honey plants on the part of American beekeepers is evidenced by the fact that several letters of inquiry always follow any reference to such plants in this Journal. Beekeepers are awake to the possibilities of new plants and well they may be since most of our commercial honey production is from plants which have been introduced from abroad. The general spread of both alsike clover and sweet clover was due to the enthusiasm of beekeepers who insistently called the plants to the attention of farmers. Much good has come to the farmers as well as the beekeepers as a result. If, however, both these plants were to be removed from American agriculture it would make a very great difference in the prosperity of the farming class. A surprisingly large part of our surplus honey now comes from alsike and sweet clover.

In view of the remarkable benefits which have followed the spread of these two forage plants it would seem that some agency serving the beekeeping industry might very well spend some effort in the search for other plants of equal promise for other regions. There are several sweet clovers in Europe not yet known here and perhaps some of them might prove to be as valuable as the white flowered and yellow flowered varieties already commonly grown here. There is said to be a blue flowered variety in Europe which is especially promising.

Other farm crops which may yet prove of value in this country are sainfoin and serradella. Serradella is a leguminous plant which is commonly grown in some European countries. It is grown as an annual in cold countries but in mild climates will stand for several years. A warm moist climate is most favorable for its growth and it is said to stand drought well and to succeed on light soils. It is reported to yield honey freely under proper environmental conditions and to be important to the beekeepers where largely grown. The search for new honey plants which are good farm crops should be continued.

Value of a Queen

When queen rearing as a specialty first began, it was impossible to foresee the extent to which it would develop. For many years there was much discussion of the price of queens and dozens of articles appeared in the bee magazines under title of "Dollar Queens."

Some contended that before the beekeeper could afford to buy freely, the price of queens must be reduced to one dollar each. Others contended that it would be impossible to sell queens at so low a price and still give the attention to their production which was necessary to insure good stock.

As so often happens, the reduction of the price increased the volume of sales to such a point that breeders made more money at a dollar each than had been possible at the higher price. With the increasing demand came more competition among the breeders and prices dropped still further until good queens could be had at fifty cents each.

Competition may be the life of trade as stated by the old adage, but too much competition results in an inferior product.

It is far better for the buyer to buy one good queen than to get two poor ones for the same money. Good queens at a fair price will bring satisfied customers and build good will, but poor queens are worthless at any price. Prices should be based on quality and the man who can produce good ones at a moderate price can expect to see his demand increase.

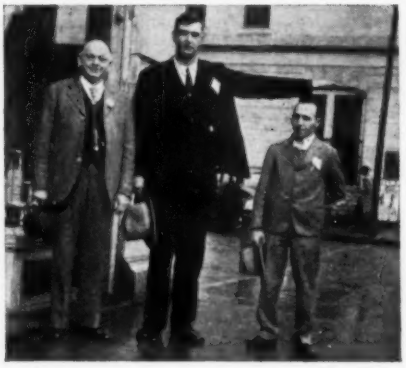
A part of the big crowd herded outside for the camera man. The rest were inside, in camp, in meeting, or downtown

Valdosta Highlights

WE HAVE WAITED to write this the last minute to get every bit of information we could. Here it is with pictures; as full a report as our space will permit. Some of the pictures were furnished through the courtesy of Editor Root, of Gleanings, and sent from Florida.

Everybody was there at this great meeting. There were probably between five and six hundred different beekeepers and visitors present, most of the states having representations. The most exciting arrival was that of thirteen from Canada escorted by Dr. Dyce, Provincial Apiarist of Ontario, and accompanied by Dominion Apiarist Gooderham, who marched into the exhibition room in army fashion to the astonishment of everyone. New York state had almost as large a delegation there as Georgia.

The place of meeting, Valdosta, was fortunate as it is on the road to the "Deep South" making it easy for



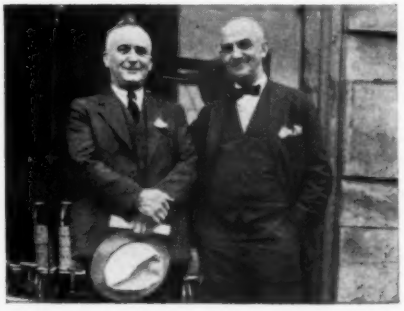
The tall and the short of it. At right, the little fellow, M. D. Sawyer; in center, the big fellow, S. J. Head, Louisiana; J. J. Wilder, Georgia, at left. (Photo by Root.)

G. G. Puett, Georgia, Secretary of the Southern Conference and master of ceremonies.

W. E. Anderson
State Entomologist, Louisiana

S. E. Merrill, Mississippi, tells Editor Cale one of his bear stories. (Photo by Root.)

E. G. Brown, Iowa, and Fred Muth, Ohio. (Photo by Root.)



Competitors get together. Left, M. S. Stone, Superior Honey Co., Utah, and Bert Woodman, A. G. Woodman Co., Michigan, at right. (Photo by Root.)

At left, the cooky section; below, the cake section of the First National Honey Cookery Contest, sponsored by the Institute, 259 entries from 24 states. Full report of winners on page 81.

visitors to continue their vacation in the land of sunshine. Every effort was made in true southern hospitality to invite enjoyment of this winter playground.

It would be very difficult to give a comprehensive report of all the discussions so we give brief notes.

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"Moving Bees by Express," D. Sadler, American Railway Express Company, Atlanta, Georgia—Losses in express shipments of packages vary even in shipments just alike. These losses must be studied to secure a reduction and avoid higher rates of express.

— o —

"Transporting Package Bees by Truck," R. M. Pugh, Provincial Apiarist, Sask.—Truck transportation of packages from the South as far north as Saskatchewan can be done with little danger from chilling of bees due to the change from warm to cold, if the bees are out of a draft and rests are made at night in a warm building. **There is more danger from overheating than from chilling.** It took ninety-three hours to drive with a truck load from Montgomery, Alabama, to delivery point in Saskatchewan. Packages arrived in perfect condition. The trip was made as quickly as by express at a saving of 20 per cent in cost. A larger truck would bring more saving. This makes it possible to take used packages South to fill again. Five hundred packages may be carried to the truck load easily. The trucks should be in good condition with plenty of lights, well insured, and should be provided with tarpaulin on sides and top.

— o —

"Responsibility for Loss in Transportation of Bees," D. D. Stover, Mississippi. — Excessive losses have caused the request of the express companies to have the losses reduced. Suggests filing all claims with one lawyer. Suggests losses may come from setting cages in sun, from covering up or overpiling or delay in Customs or placing in solid cars. There are unapparent losses too, such as delayed colony development crop losses. Truck shipments offer a possible way of improving the situation.

— o —

"Supersedure," H. C. Short, Alabama.—Suggests that supersedure in package bees may be the result of poor queens such as old breeders, chilled queens, queens made poor by handling or developed from underfed or chilled queen cells. Supersedure may be also the result of the lack of proper food or of clipping before introduction or forced idleness during the period of the development of the package into a colony, due to lagging cell building with excessive new brood and little emerging brood.

— o —

"Expansion of the Local Market," T. W. Burleson, Texas.—Do not try to put a poor grade of honey on the table. Select only the best, dress it well, clean it well, grade it and ad-

(Please turn to page 70)

Tom Atchison
State Apiarist, Alabama

Father Francis Jager, the genial Minnesota leader.

James I. Hambleton, our Washington Apiarist.

A Discussion of the Marketing Agreement for Package Bees, Queens

By R. H. McDrew,
Marketing Specialist,
Agricultural Adjustment Administration.

Excerpts from an address before the National Conference, Valdosta, Georgia, December 20.

IN DISCUSSING this agreement and license, I would like to start with fundamentals so every shipper of package bees and queens may be informed as much as possible of its obligations and benefits.

First, let me state that I have observed in bee journals and in correspondence in reference to this agreement and license that they are called a "code" or "trade agreement." In my judgment these terms are misleading, and indicate that this marketing agreement and license is a code under the National Recovery Act or a private trade agreement. Neither is true. It should be called what it is—a marketing agreement.

This marketing agreement is not merely a private compact among shippers, but is sanctioned and developed in accordance with the Federal law known as the Agricultural Adjustment Act providing that the Secretary of Agriculture may enter into marketing agreements with processors, associations of producers, and producers for the purpose of bringing prices of agricultural products more nearly to the parity price which in general is taken as the price during the base period August, 1909, to July, 1914.

In accordance with the Act, the Secretary of Agriculture has promulgated certain rules and regulations to govern procedure in effecting marketing agreements. Under this procedure you have today this marketing agreement under the laws of the United States, which is binding on every one of the 75 per cent of the industry who signed it.

To prevent the possibility of an unwilling minority defeating the purpose of the agreement, the Secretary was given power to issue licenses to require this minority to cooperate with the majority to make the policy of the Act effective. The Secretary has, therefore, executed a license for all shippers of package bees and queens, which has the same terms and provisions as the marketing agreement, and this license is effective, under law, to every person in the United States who ships package bees and queens. The very fact that you ship package bees or queens makes you a licensee, whether you signed the agreement or not, and makes you subject to all of its terms and provisions, a violation of which is at least an indirect violation of the laws of the United States and subject to action in the Federal courts. The Secretary, after a hearing, may revoke a license, and any person who carries on the business covered by the license, after revocation, is subject to a fine of a thousand dollars for each day he operates.

The agreement and license authorizes the Control Committee and the Managing Director to do certain things, and when they act in accordance with these documents their action is just as binding on the shippers as though it were taken by the Secretary of Agriculture himself.

The minimum prices in effect before the first day of December, were prices that were attempted to be established by the Control Committee before the marketing agreement and license became effective and before there was, as a matter of law, a legally-acting Control Committee. So, no shipper of package bees and queens can be charged with violation if he failed to observe the schedule of prices which existed prior to December 1, 1934.

However, at its November 2 meeting, the Control Committee proposed a schedule of prices in accordance with the terms and provisions of the marketing agreement and license, which schedule was approved by the Secretary on December 1, without discounts. The failure to approve discounts brought protest from many shippers of bees and queens and buyers. It was explained to the Control Committee and members of the industry that quantity discounts could not be approved because of the likelihood of discrimination against small shippers. The Control Committee, after advising with leaders and state officials, re-adopted the December 1 schedule with an allowance of a dealer discount of 15 per cent, and the reduction of the price of nuclei to the price of packages. [This has been approved by the Secretary of Agriculture on January 18, and is now effective.]

However, remember this point. Some of the provisions of this agreement and license are in conflict with the anti-trust laws and so supersede the provisions of them, placing a heavy responsibility on the Secretary of Agriculture to see that this suspension of the anti-trust law does not result in injury to the general welfare or to small operators.

I congratulate the shippers of package bees and queens for their almost unanimous cooperation in making effective this agreement and license. I am told by the Managing Director that his records show that 95 per cent of the shippers have compiled with this in letter and in spirit. No better cooperation can be found in any other group of farmers.

Now, a word as to your obligations under the agreement. Those who have not made reports to the Managing Director as requested by him are legally obliged to do so now and also are legally required to pay their assessments on all business transacted since May 6th, 1934. There are three major obligations. (1) You must make your reports as requested by the Managing Director. (2) You must pay all back and current assessments, if due. (3) You must observe the minimum prices in effect at the time you make a sale.

A comment on minimum prices. They are just what the word "minimum" implies. If you feel that they are too low, you may charge higher prices. These minimum prices are simply bottom prices to prevent the "Chiseler" or any person from ruining the industry by unduly cutting prices.

We believe this agreement and license will be a great help to producers of package bees and queens, and the members of the staff of the General Crops Section will do everything necessary to help you carry on in an effective manner.

Another Mild Winter?

We are enjoying fine weather here yet (November 13). No snow and the bees had several flights this month, 4th, 6th and 7th. It is 26 above here this morning. October 25 was the last day they carried in pollen. W. J. Blume, Wisconsin.

Final Minimum Prices of Package Bees and Queens

THE FOLLOWING is Exhibit A released by Managing Director J. M. Robinson at Auburn, Alabama, giving final minimum prices for shippers of package bees and queens under Trade Agreement for 1935. Please read and note changes particularly discounts to dealers. The original unamended list was published in the January number. The present list replaces that one. Shippers notice! Buyers notice!

Exhibit A—Minimum Prices for Marketing Agreement and License for Shippers of Package Bees and Queens:

Section 1. **Minimum Prices to Consumers.**—Minimum prices to consumers for package bees, nuclei (comb packages), and queens are hereby established by the Control Committee pursuant to article III of the Marketing Agreement and pursuant to article II of the License for Shippers of Package Bees and Queens Produced in the United States; and such minimum prices to consumers, until changed, shall be as follows:

1. The price of queens shipped or delivered from November 1 to May 31 shall not be less than seventy-five (75) cents each, postpaid; and the price of queens shipped or delivered from June 1 to October 31 shall not be less than fifty (50) cents each, postpaid. The price of each purely-mated queen shall not be less than double the price of each queen, postpaid.

2. The price of each package of bees with one queen, shipped or delivered from November 1 to May 31, shall not be less than the following prices:

(a) For two (2) pounds of bees net, $2.45 each; and for three (3) pounds of bees net, $3.15 each. For each additional pound of bees added to such 2-pound or 3-pound packages not less than seventy (70) cents additional.

3. The price of each package of bees with one queen, shipped or delivered from June 1 to October 31, shall not be less than the following prices:

(a) For two (2) pounds of bees net, $1.95 each; and for three (3) pounds of bees net, $2.55 each. For each additional pound of bees added to such 2-pound or 3-pound packages not less than sixty (60) cents additional.

4. When packages of bees mentioned in subsections 2 and 3 of this section are sold without queens, the price of such queenless packages shall not be less than the minimum prices specified in such subsections after deducting the minimum prices for queens specified in subsection 1 of this section.

5. When packages of bees are shipped by parcel post, the shipper shall charge the purchaser postage and ten (10) cents per package above the prices scheduled in subsections 2, 3, and 4 of this section.

6. The prices of nuclei (comb packages) with one comb, two (2) pounds of bees net, and one queen, shipped or delivered from November 1 to May 31, shall not be less than $2.45 each; and the prices of such nuclei containing three (3) pounds of bees net shall not be less than $3.15 each. The prices for each additional comb added to any such nucleus shall not be less than forty (40) cents additional to the prices specified in this subsection for each 2-pound and each 3-pound nucleus; and the prices for each additional pound of bees in each such nucleus shall be not less than seventy (70) cents additional to the prices for such 2-pound and 3-pound nuclei specified in this subsection.

7. The prices of nuclei (comb packages) with one comb, two (2) pounds of bees net, and one queen, shipped or delivered from June 1 to October 31, shall not be less than $1.95 each; and the prices of such nuclei containing three (3) pounds of bees net shall not be less than $2.55 each. The prices for each additional comb added to any such nucleus shall not be less than forty (40) cents additional to the prices specified in this subsection for each 2-pound and each 3-pound nucleus; and the prices for each additional pound of bees in each such nucleus shall be not less than sixty (60) cents additional to the prices for such 2-pound and 3-pound nuclei specified in this subsection.

Sec. 2. **Minimum Prices to Dealers.**—Minimum prices to dealers for package bees, nuclei (comb packages), and queens are hereby established by the Control Committee pursuant to article III of the Marketing Agreement and pursuant to article II of the License for Shippers of Package Bees and Queens Produced in the United States; and such minimum prices to dealers, until changed, shall be as follows:

1. Minimum prices to dealers for packages, nuclei (comb packages), and queens shall be the prices listed in section 1 of this exhibit less a discount of 15 per cent.

Sec. 3. **Definitions.**—The following terms used in this exhibit shall have the following meanings:

1. "Consumer" means any person who buys packages, nuclei (comb packages), and/or queens for the purpose of using them in honey production, and/or bee breeding, and/or pollination, and who actually uses them for such purpose or purposes.

2. "Dealer" means any person who buys packages, nuclei (comb packages), and/or queens for the purpose of re-selling them and who actually re-sells them to consumers or to other dealers.

3. "Person" means an individual, partnership, corporation, association, or any other business unit.

Sec. 4. **Basis of Prices.** Except as otherwise provided in this exhibit or in the Marketing Agreement and License, all prices specified in this exhibit shall be F.O.B. prices at the shipper's or licensee's place of business or F.O.B. shipping point nearest to such place of business.

SUMMARY OF PACKAGE BEE, NUCLEI, AND QUEEN BUSINESS FOR 1934. (BY STATES.)

	Queens Individually	Queens With Pkgs.	Total	Packages	Nuclei	Value
Alabama	37,187	26,798	63,985	27,665	252	$89,175.10
Mississippi	19,736	24,096	43,832	24,908	7	70,221.70
Georgia	9,341	14,778	24,119	15,129	81	44,041.84
Louisiana	9,304	14,044	23,348	15,112	227	41,405.96
California	18,453	11,225	29,678	11,672	20	39,997.88
Texas	12,412	7,426	19,838	7,707	327	29,023.62
Ohio	8,235	2,550	10,785	2,550	0	14,416.45
South Carolina	1,688	708	2,396	743	0	3,068.32
Florida	2,340	385	2,725	385	0	2,452.29
Illinois	481	831	1,312	851	3	2,425.65
Indiana	1,461	0	1,461	0	0	1,544.85
New Jersey	1,677	104	1,781	99	5	1,424.35
Connecticut	1,546	14	1,560	6	8	1,113.60
Wisconsin	285	320	605	320	0	1,105.30
Michigan	1,270	13	1,283	1	12	1,021.38
Tennessee	1,331	79	1,410	69	10	932.79
North Carolina	1,233	10	1,243	10	0	843.47
New York	987	0	987	0	0	661.55
Arkansas	390	97	487	92	5	514.80
Missouri	600	2	602	9	0	423.90
Iowa	190	4	194	0	4	161.05
Nebraska	29	11	40	11	0	60.20
Maryland	26	0	26	0	0	22.00
Oregon	5	0	5	0	0	9.00
Total	130,207	103,495	233,702	107,339	961	$346,067.05

What to Read

So many fine letters have come to us in response to the request in the last two or three issues that subscribers make suggestions about what they would like to see in the pages of future numbers of the American Bee Journal that we wish we could give a summary of it all this month, but so many other matters press for attention, we will have to delay this interesting summary until another issue.

In this issue the article by Alfonsus, "Establishment and Value of Mating Stations," page 78, is written at the request of Mr. Harrison Moore, of Oakland, California. We hope that we will be able as promptly to get information on other subjects in which readers are interested. It does not always work that way. This is an interesting article and has many worth while suggestions.

Poison Spray

J. O. Kane, who has been in the honey business for several years on a ranch near White Swan, has moved to a new home near Forest Grove, Oregon. Mr. Kane made the change because he lost many bees from poisonous sprays used in orchards and potato fields. I. L. Neill,
Washington.

Ned Prevost, Extension Apiarist, South Carolina—"buckfever."

Valdosta Highlights

(Continued from page 67)

vertise it. Support the American Honey Institute.

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"Honey Clarification," Dr. R. E. Lothrop, Washington.—A discussion of the clarification process developed by the Bureau of Chemistry and outlined in all the bee papers of recent issues. This process removes scum and foam, brightens the honey and does not remove any food value or flavor. A thousand pounds daily output can be obtained from equipment which costs about $200 for the essential parts. It is hoped that later simplification of equipment will still further reduce the cost to the small packer.

H. F. Wilson, Chairman Finance Committee, A.H.I.,—$10,000 by 1938.

George Rea, Extension Apiarist, New York. "Smiling George."

"Florida Beekeeping," Dr. Waldo Horton.—"Don't pass on to heaven without first seeing Florida."

— o —

"New Standards in Foods," Mary I. Barber, Battle Creek, Michigan.—Vitamins, bone building elements, elimination foods and so on were not a part of the old language about food in the home but they are today. We must conform to the new ideals. That is the purpose of the Institute. Kelloggs are doing their best to cooperate wholeheartedly in this program. We must work with other organizations, make professional contacts, to increase the interest in honey and its use.

In its publicity work for honey in 1934, the Kellogg Company distributed 25,000 posters, 150,000 recipe leaflets, featured honey in the Sing-

Russell ("Russ") H. Kelty, re-elected President. A.H.I.

ing Lady broadcasts. If the Kellogg Company does this, why not enlist the support of other commercial firms? Make more tieups of this sort.

We need more recipe testing. The Institute needs more funds to follow up its mailing more consistently. Beekeepers are losing from not being able to support the different requests for material which comes to the Institute. The Institute also is short of funds for making more valuable school contacts.

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American Honey Institute, Secretary's report, Mrs. Malitta Jensen.

The American Honey Institute is an impersonal organization belonging to beekeepers, the purpose of which is to interest more people to use more honey. Note the continuity in the magazine copy this year about honey. Examples — Parents' Magazine, American Cookery, Chicago Tribune. The latter distributed 116,000 copies of a leaflet including honey at 5 cents a copy. Note the increase in the number of official bulletins on the use of honey from two to nine with four in preparation; the advertising agencies that are adding honey to their material files. The Institute has a program which embraces the consumer, the producer, the institution and the research laboratory.

— o —

"Institute Finances," H. F. Wilson, Chairman Finance Committee.–Membership in the Institute has increased from 363 to 987. Funds from contributing beekeepers have risen from $450 in 1930 to $6000 in 1934. The Institute's budget should be $10,000 which we expect to raise on the average of $1000 additional each year up to 1938. The average annual production of honey in this country

R. E. Foster, Florida's popular State Apiarist.

is 162,000,000 pounds which at an average supporting figure of 10 cents a ton would give $8000.

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"National Honey Week and Our Emphasis Program," Kathryn Lanier, Food Specialist, Georgia.—The work in Georgia now concerns the preservation of Georgia's natural products

(Please turn to page 80)

WINTER YOUR BEES!
Why Not Packages Every Year?

BASSWOOD, MILKWEED, FIREWEED, SWEET CLOVER AND PLENTY OF MINOR PLANTS AROUND THE BARTLETT YARDS. MANY BEEKEEPERS HAVE THOUGHT OF THIS PLAN BUT FEW HAVE TRIED IT AND KEPT CLOSER TAB ON IT.

By A. G. Woodman,
Michigan,
and
M. G. Dadant,
Illinois.

PLENTY of us are in the beekeeping profession, who have some of the old school feeling for the bees, like to call the hives by their first names, know just what to expect of each colony in the yard, even consider we owe the bees a winter's life in return for our own livelihood and pleasure.

But our whole system of life seems to be changing, whether by necessity, invention, or choice. Live stock, poultry raising and breeding are all ruled by efficiency, convenience. Even with us humans, our family size is dwindling in number. Our ease of life too often is predominant over our willingness to sacrifice ourselves to toil.

Why then should we not rule our efforts in beekeeping by the same yardstick. Why not clean out all of our bees every fall and start anew with packages in spring, especially when we are sure that foundation stock is abundant in the South. That is, why not do it—if it is feasible?

If you were a queenbee and had "gone the limit" in laying two or three thousand eggs every day for ten weeks, wouldn't you appreciate a relief from duty, a vacation from July on, so to speak? If you were a worker bee with wings frayed from excessive flight in gathering honey, and if your term of life were only a few weeks at the most, would it matter if it were all over in September?

Think it over.

The writers had the pleasure of visiting the yards of that big North Michigan beekeeper, Ira D. Bartlett at East Jordan, and to enjoy the hospitality of the Bartlett family in their home.

We visited seven of the twelve Bartlett outyards on August seventh. There wasn't a single cell of brood in any of the hives. There were no boarders. There were no eggs or brood to feed or keep warm. Everybody worked but father. All worker bees were released for field duty, or for evaporation of nectar.

The general plan of procedure is as follows:

Eight hundred or more packages of bees with queens, mostly three-pound size, are received from the South in early spring. Colonies are started from these in a mammoth nursery yard. The packages are placed in hives containing drawn combs, four or more of honey, two of pollen, and the rest empties.

About June first, these colonies are moved to their summer locations, about fifty to a yard, though Bartlett feels that probably forty would be better. At this time an additional body of drawn combs, honey and pollen is added **below** the first one, for brood and feed purposes.

Additional supers for storage are added as needed.

The first week in July, Bartlett starts preparing for the fall. All queens are caught and left caged in the bottom body of the hive, and a queen excluder is placed under the lowermost body, next to the bottom board. By the first of August, all the brood is gone, all bees are active in the field.

Most of the white honey is in the hives by the middle of August. Bartlett strips the hive to the last body, still containing the caged queen. The single body is left as sitting room for the bees, and a body or two added for the fall flow.

In September or when frosts have nipped the vegetation and stopped the flow, the old worn out bees and queens are snuffed out with a cyanide gun. The fall honey and all equipment is gathered up, stored, sorted and prepared for the next season's activity in this remarkable yearly

At left: Ira D. Bartlett, standing by two hives with the honey from spring packages. Below: Bartlett and Woodman, examining 27 packages received April 23. They were stacked up like this on August 5.

cycle of honey production. The fall honey serves for feeding and building the packages in the spring.

Bartlett was asked when he had his packages arrive. "April 23 seems to be the ideal date according to my past experience," said he.

Those 800 packages in one nursery yard looked big.

"I could keep two thousand" said Bartlett. "Plenty of water, the hills make good wind protection, and look at the flora—willow, maple, poplar, in fact all the minor sources, and in abundance."

That second body underneath brought a question.

"That is ideal," he said, "the bees are working well in the top body. The one underneath acts as a safety valve. The bees don't go right below. They draw on the reserves at the bottom, round out the top super with brood, then gradually build below till the two supers are fully occupied."

It is well known that a good queen's activity in laying eggs to capacity is governed largely by a backing of ample stores, giving her confidence. Bartlett says, "For best results I must have a queen laying to full capacity for ten weeks, and when I supply ample stores and pollen and other favorable conditions, it is purely up to the southern breeder and shipper to supply queens that will hold up and not dwindle away in a few days or a few weeks."

How do you get rid of the drones?

"By opening the tops of the hives about the first of August, on a hot day. The drones will fly out, and, not being able to return through the excluder on the bottom, are all dead in three or four days, as the bees do not feed them."

How do you take off the honey?

"Phenol or carbolic acid crystals, mixed about one part of water to four of crystals. The job goes very fast. I actually drove out the bees and loaded eighty-six full depth supers on a truck and was ready to go in twenty-six minutes, in a test for speed."

Bartlett also explained that the combs he holds over for starting his packages in spring have much more pollen in them when the bees are snuffed out in September than they would have had with queenright colonies.

Bartlett was asked if, with his experience, he might go back to wintering his bees.

"Not under any consideration," said he. "Of course I don't recommend it for everyone and for all locations. The honeyflows, the wintering condition, and spring sources for honey and pollen are very important items. For my location and my conditions, no wintered bees for me."

Bartlett's location does look like a good one. Besides the early spring flora he has basswood, raspberry, alsike clover, some fireweed, and he is in the heart of the milkweed. He looks forward to the addition of sweet clover in such quantities to add materially to the length and volume of the total flow.

He has little trouble with swarms. The caged queen in the lower story still leaves the colony queenright. Such virgin queens as may issue cannot escape to mate, and the very few swarms issuing return immediately to their parent hive.

As we size up the situation, the success or failure of this plan of honey production depends

First, on the ability of the southern breeders and shippers to deliver dependable queens that will hold up at least to normal and not peter out in a few days or weeks. Or in other words on the number of producing colonies that can be secured from a shipment of one hundred packages of bees. A 20 or 30 per cent loss or shrinkage in queen failure or non-producing packages, not only increases the producing package cost this much, but the producer has to wait another year before he gets another chance, which is a serious matter.

Bartlett said he can stand a 10 per cent loss of colonies by doubling, for he will not tolerate a "dud" colony in the yard. A larger shrinkage makes it harder to get a profit. "If I could get away from the unproductive packages as a result of queens that fail at once," said he, "or those that lay three or four frames of brood and then disappear, there'd be nothing to it."

Second, on a location with an abundance of major honey producing plants, as well as minor ones. Bartlett wants a two hundred pound colony average to insure him a good season. This looks big, yet when we consider that he has a force of bees for nearly a month in the heart of the flow with nothing to do but produce, no brood to care for, and that it is not necessary to plan for fall and winter stores, the average doesn't look quite so large.

Third, on a fair price for honey. A cent or two in the price on large production means profit or loss, especially when good money is paid out; and one must get good money back to balance. This is where home production or the overwintered colony appears safer; nothing going out, everything coming in. That is if you produce or winter your own bees and pay out nothing for packages, it looks like a little surer game.

The Bartlett plan as operated by him brings a little different viewpoint than that of most purchasers of packages. The great majority buy packages because they want to increase their number of colonies. Bartlett cares nothing about hives of bees. His objective is a honey crop—and the best way to get it. With this in view he doubles and perhaps redoubles to get results.

Then we have not taken into account the cost of wintering a colony of bees, the amount of honey that it would take to winter, also that they might consume twenty-five pounds of honey and then die, in which case he would have neither bees nor honey.

By the Bartlett method, he can wipe the slate clean at the end of the season. He has no uncertain values in live bees (and stores to winter them) that may or may not live.

He knows just how much the bees have cost him, his expense of operation, what the crop sold for, net gain or loss. He knows just where he stands.

Such a plan has its hazards. Anyone going into it should be pretty sure of his ground. Bartlett or the man with his honey flora conditions no doubt is succeeding. Can the average beekeeper with the average flora and climatic conditions do as well, or will he make more profit year after year with the orthodox wintering over methods?

Solving the Disease Problem

By Frank C. Pellett,

Illinois.

IT seems to me that we have been a bit blind in handling our disease problem. If we review the past, it is easy to see what brought about the present serious situation. For centuries beekeeping was a very primitive undertaking. The bees were permitted to swarm naturally and at certain times a part of the colonies were smothered and the combs cut out to be melted up after the honey had been drained out. Any colony which developed a tendency to fall behind its fellows was thus destroyed.

Colonies which developed a natural resistance were thus most likely to be retained and nature's law of the survival of the fittest continued its natural operation. Thus American foulbrood did not become a matter of serious concern to the beekeeper until the invention of the movable frame hive and the development of our present highly specialized system of beekeeping.

In looking over the literature one is a bit surprised to find that the presence of disease was recognized by those who first wrote about bees two thousand years or more ago. It is even more surprising to find that in European countries where it has existed throughout this long period, it is not regarded as a matter of serious importance.

With these things in mind we may look for an explanation for the fact that here in America, where hundreds of thousands of dollars have been spent in a vain attempt to eradicate American foulbrood, it offers the greatest concern.

To me it appears to be very plain that our system of queen rearing where hundreds of daughters are reared from a single mother and scattered to the four winds, may be the seat of the difficulty. We have selected stock for color, gentleness or honey production, paying but scant attention to the matter of disease resistance. Under the old plan the susceptible strains disappeared in the natural order of events. Now they are nursed and increased to an unnatural extent and used to replace those which nature has provided with a measure of resistance until the dominant strains of bees in our apiaries are decidedly susceptible to disease.

The Result

The result is so well known that it is not necessary to dwell upon it at length. Efficient inspectors go into a neighborhood and by means of careful work reduce the percentage of disease to a very low point, but as soon as they withdraw it springs up again and within a few months is as bad as before. They dare not relax their vigilance, since to do so invites disaster.

There are plenty of instances where inspectors have seemed to get the better of the disease for a time and where they could point with pride to localities apparently entirely cleared of it; but these results were only temporary. There is always some source of infection overlooked somewhere which reduces the value of our work and makes it necessary to do it all over again.

The Remedy

While we may disagree as to the best thing to do, we are all agreed that we need to find some better or a least some more effective remedy than has so far been used. The most natural suggestion is to try the thing that solved the difficulty with the two diseases which have ceased to cause us serious anxiety; and that is to seek resistant bees.

Here again we find some elements of surprise. For several years our friend F. B. Paddock has been calling attention to the fact that Caucasians are less subject to American foulbrood than Italians and he assumed the reason to be because they were less inclined to rob. A bit of investigation, however, indicates that the real reason is that the race having continued to propagate by natural selection instead of so generally by artificial methods, is more resistant to disease.

For several years a few beekeepers have been calling attention to the fact that certain colonies showed marked ability to resist American foulbrood or even to clean out the scales after it had become established. They received little encouragement. Authority has continued to teach that once a colony has acquired this disease it cannot by itself again be free from the disorder.

An Iowa beekeeper had a number of colonies of Italians which showed marked ability in this direction. The young queens reared from the queens heading these colonies, however, failed to carry the desired characteristic over to the new generation. The answer seems to be that they were mated to drones of susceptible stock and the resulting offspring lost the much-to-be-desired quality.

The thing which must be done is to search out colonies with the ability to clean up disease and to rear large numbers of young queens from this stock. These young queens must be mated to drones of known parentage from similar strains. A certain num-

ber of the young queens will inherit the disease resistant character and in time it can be fixed as a dominant one.

More than fifteen years ago I was shown a colony in the yard of a well known beekeeper and told that this colony had cleaned up a case of American foulbrood without assistance. A most careful examination failed to show a single diseased larva. That strain of bees is still available and has continued to make a good showing in the face of frequent reinfections until the present. The past season it is reported that twenty of twenty-seven diseased colonies cleaned up. At the close of the season those colonies which failed to clean up were destroyed as they should have been.

A recent letter from Charles Mraz, of Vermont, contains some very interesting information. He found that native bees, Italian bees mixed with the blacks, showed much more resistance than the pure Italian stock offered by well known queen breeders. While some colonies showed only a few cells of disease the high bred stock soon became so badly infected that he burned them up. Some colonies cleared out the scales and polished out the cells as though they had never been diseased. Some colonies which cleaned up in 1932 have remained clean throughout the seasons of 1933 and 1934 and have given good crops of honey.

Mraz contends that in regions where modern methods are not in use, we may expect to find strains of bees which have developed resistance and that such stock can be secured for all the races in common use. The fact that bees continue to prosper in spite of disease in localities where primitive methods are in use and where no inspection is practiced, supports his contention.

The difficulty lies in the fact that this disease resistance is not yet to be depended upon. The bees may clean up and remain fairly free from contagion until the queen is superseded, when disease may develop to a point which makes the colony worthless. All that we have, as yet, is a basis on which to work. The best stock can serve only as material for the skilled breeder to work with in developing a strain of bees which really is able to resist disease permanently.

To assure ourselves that such a result is possible we have only to look at results obtained by breeding in other fields. In the Chicago Journal of Commerce for October 20 appeared the following statement:

"Strains of good old yellow corn have been developed through inbreeding and hybridization on the Funk farm that are all but immune to damage from chinch bugs, corn borers, the various rot diseases and frost."

It has been demonstrated that any desired quality can be secured in time by skillful breeders. All our common species of farm hens have been developed from a common ancestor, yet the Brahma fowl would seem to have but little in common with the Leghorn or the Bantam.

Within the past few years cabbage culture became all but impossible in certain localities because of disease. Here and there a plant showed resistance and plant breeders took these resistant plants and by careful breeding and selection have developed a strain resistant to disease. A few weeks ago I visited a market garden where the resistant cabbages were growing side by side with the old varieties. On one side of the path the cabbages were large, well developed, a bright green color and offered promise of an abundant crop. On the other side the plants were discolored, dead or dying, many were half rotten and but few good heads were to be had. The difference was solely one of resistant stock.

The same thing has been true of tomatoes and of numerous other plants, notably the garden or China aster which has been saved to the florist by similar means.

We are told that nature gradually builds up an immunity against any disease. Certain disorders which are common among civilized people are now seldom serious, yet when the white race came into contact with primitive races which had not been exposed to these disorders, they died by thousands.

There can be no question as to the possibility of developing a strain of bees resistant to disease. The individual beekeeper can hardly expect to be successful since it requires too much time and too much expense to secure the proper stock and insure proper mating. Our experimental stations can accomplish it, however, with sufficient means and a trained personnel. Let us encourage them to make the attempt.

Occasionally a colony of bees may be found which does not take disease even though it be surrounded by it. It is practical for the beekeeper to raise queens from such colonies and requeen all his hives with them. Diseased colonies should be destroyed or treated as we have been doing. If we begin selecting the stock which fails to take disease for use in breeding, we will soon make substantial progress. Disease is never to be trifled with. Destroy diseased colonies but watch for the ones which show resistance. If our inspectors will select such colonies and put them in the hands of commercial queen breeders for general distribution they will greatly relieve their own problems by reducing the number of diseased colonies to be dealt with in the future. It is a slow process and one which must be carried through in cooperation with our inspection forces but it holds promise of ultimate success.

Production Costs

By Penn G. Snyder,

Ohio.

Charles Kruse paints a pretty picture in his article on page 483 of the November issue. I will agree with him as to production costs with no interest on capital invested in bees and equipment if someone will give me the bees and all the material needed and throw in what labor may be needed to produce the crop. Under these conditions I would not charge interest or labor costs to the crop of honey as they would not exist. If one can produce a crop without bees or equipment, he naturally would not have to meet these costs. Personally, I need the bees and equipment if I expect to produce a crop of honey.

If one puts one thousand dollars into a government bond or invests it in stock or some business venture, it is done with the expectation of later receiving the capital back intact, plus the interest which the money is supposed to earn for one.

If any factory attempts to operate and continue in business without a replacement or depreciation fund, that factory is going into the hands of a receiver just as soon as the equipment wears out.

This applies equally well to the beekeeper. If his profit or gross returns are not sufficient to cover the wear and tear and ultimate replacement of his equipment plus a living wage, the time will come when replacements will be absolutely necessary, and if the funds to make them with are not forthcoming from his profits, he will be compelled to do one of two things — borrow money and pay interest on it to purchase the needed equipment or sell out for what he can get and quit.

Almost any skilled operating beekeeper can deliver a fancy article at any price the buyer may care to offer. However, if the price is too low the producer is giving away either his labor or his capital, and he cannot continue to do either the one or the other beyond a certain point as there will be an end to his capital. To produce honey you need both. Not the least of such a condition is what he is doing to the man who is trying to continue with at least a bit of business foresight which will, at least, leave him something to live on.

Our present government itself is now backing the man who demands a living wage for his product or his labor.

A Disease of Young Bees Caused by a Mucor

By C. E. Burnside,

Assistant Apiculturist, Bureau of Entomology,
United States Department of Agriculture.

WHILE studying bee diseases caused by fungi (5)* the writer observed several species of **Mucor** growing on dead adult bees. The most common of these, which was not specifically distinct from **Mucor hiemalis** Wehmer-Hagem, was also found growing within the digestive tract and muscle tissues of sick bees. Both zygospores and sporangia of this species were found on the surface of the exoskeletons of dead bees, through which the mycelium had grown from the inside. The **Mucor** was isolated in pure culture and the sex strains were separated (4).

Within the digestive tract of sick bees this fungus was found to have a very different appearance than when it grew on bread or nutrient agar. Instead of growing in the usual filamentous branched form the mycelium developed largely as clusters and branched chains of globose, oval, or barrel-shaped cells (figs. 1 and 2) measuring about 6 to 18 by 6 to 24 **u**. When young the walls of the cells were thin but later many of them became thickened, forming chlamydospores. Within the digestive tract of sick bees the mycelium was markedly yeastlike, but within muscle tissues of sick bees filamentous mycelium predominated.

Since this **Mucor** grew within living bees the question arose concerning the possibility of its being pathogenic for bees.

Mucors frequently cause rot of stored vegetables and fruits and sometimes attack growing plants but are generally considered nonpathogenic for animals. It has been reported from Germany, however, that the disorder of adult bees known as "May disease" is caused by **"Mucor melittophorus"** (1) and also by **"Mucor mucedo"** (2), which, it is said, was observed growing in a yeastlike manner within the bodies of sick and dead bees. Betts (3) found **Mucor erectus** Bainier growing on dead bees and Fielitz (6) reported that **Mucor mucedo** killed bees in capped cells and an occasional adult bee.

In attempting to determine whether **M. hiemalis** is pathogenic for healthy bees or whether it attacks only dead or sick bees, the following experiments were performed.

In the earliest experiments bees of undetermined age were shaken from brood combs and about fifty placed in each of six cages. The bees in two cages were inoculated by feeding them sporangiospores from cultures of **M. hiemalis,** suspended in a 25 per cent solution of honey water. The bees in two other cages were similarly inoculated with chlamydospores and mycelium from sick and dead bees. The bees in two cages which served as checks were fed with honey water solution without fungus spores.

One of the bees from a lot inoculated with spores from sick and dead bees became infected but none of the check bees or those inoculated with sporangiospores from cultures were attacked.

In another experiment the bees in three strong colonies and one weak colony were inoculated by feeding them sporangiospores from cultures of the **Mucor,** mixed with a 25 per cent solution of sugar. The bees in the three strong colonies were not noticeably affected but a mucor was found growing in a few recently dead bees collected near the weak colony five days after it was inoculated. The results from both of these experiments were considered either negative or inconclusive and the experiments were temporarily discontinued.

About a year later in connection with other experiments in which bees one day old were kept in cages at room temperature, it was observed that a few of them seemed to be attacked and killed by a **Mucor** which in culture appeared identical with **M. hiemalis.** These experiments were repeated several times and, although in a few cages none of the bees were infected, in most of the cages from 1 to 2 per cent were infected, and in some cages the fungus killed from 4 to 5 per cent. About the same number of bees were attacked when the food was sterilized, which eliminated the food as the source of infection.

These observations suggested that the fungus might be pathogenic for young bees, even though older bees are not attacked; therefore, experiments were performed in which both old and young bees were inoculated. Bees that had recently emerged from brood combs and older bees caught at the hive entrance were placed in separate cages (about fifty bees per cage). Three cages of young bees and three of old ones were inoculated by being fed sporangiospores and mycelium from culture of the **Mucor** mixed with 20 per cent sugar syrup. One cage of young and one of old bees were not inoculated but were given 20 per cent sugar syrup and were kept as checks. All the bees were kept at room temperature, or about 20° C. (68° F.), and the cages were examined several times daily for sick and dead bees.

The death rate among the old bees and also among the young bees that

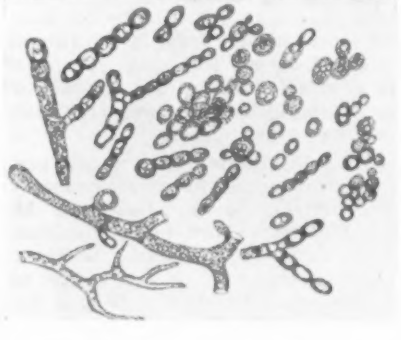
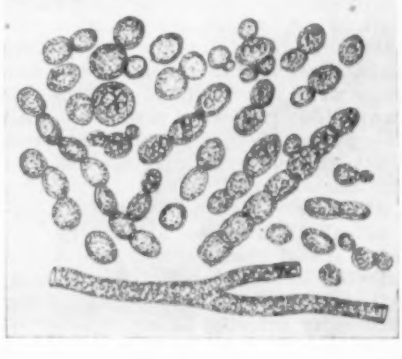


Fig. 1.—Mycelium of **Mucor hiemelis** from a bee killed by this fungus.

Fig. 2.—Mycelium from a sick bee infected by **Mucor hiemelis.**



*Black numbers in parentheses refer to Literature Cited at the end of this paper.

were not inoculated was practically normal, and none of them were infected by fungi. Beginning with the second day, the death rate among the young inoculated bees was much higher than normal. About 75 per cent of these young inoculated bees, upon dissection and microscopical examination at the time of death, were found to be heavily infected by the **Mucor.** None of the check bees or the inoculated old bees were infected.

It was suspected, since bees in strong colonies are rarely attacked by this fungus, that young bees are more susceptible at room temperature than at brood nest temperature, which is about 34° C (93.2° F.). In order to determine whether this is true and to obtain additional proof of the pathogenicity of **M. hiemalis,** inoculation experiments were conducted at room temperature, or about 20° C. (68° F.), at 27° C. (80.6° F.) and at 37° C. (98.6° F.). Bees that had recently emerged and older bees caught at the hive entrance were placed in separate cages (about fifty bees per cage). One cage of young and one of old bees that were inoculated by being fed spores of the **Mucor** taken from cultures and mixed with 20 per cent sugar syrup were kept at each temperature. In a similar series of experiments three cages of young and three of old bees inoculated with chlamydospores of the **Mucor** from infected bees were kept at each of the three designated temperatures. One cage of young and one of old bees, not inoculated, were kept at each of these temperatures as checks.

The death rate among all the check bees was about normal, although two young bees that were kept at room temperature were infected by a **Mucor** at the time of death. None of the old bees that were inoculated became infected at any temperature and none of the young bees were infected at 37° C. (98.6° F.). At 27° C. (80.6° F.) one young bee that was inoculated with sporangiospores from cultures and three that were inoculated with chlamydospores from infected bees were attacked and killed by the fungus. At room temperature, about 20° C. (68° F.), **M. hiemalis** was again found to be extremely virulent for young bees. About 75 per cent of the young bees inoculated with spores of the fungus from culture died of infection within five days. Bees that lived longer than five days were not infected. Among the young bees that were inoculated with chlamydospores from the digestive tract of sick bees infection reached 100 per cent. All of these bees died within five days and upon microscopical examination at the time of death all of them were found to be infected by the fungus. The **Mucor** was re-isolated several times from artificially infected bees.

Microscopical examination of inoculated bees showed that spores of the fungus taken into the digestive tract of young bees at room temperature germinated quickly. The mycelium that developed consisted principally of yeastlike cells (figs. 1 and 2) and a few filamentous hyphae. Filaments often gave rise to yeastlike cells, and vice versa. Before death of the infected bees mycelium usually penetrated the wall of the digestive tract and developed within the muscles of the thorax and other tissues. Within muscle tissue mycelium was predominantly filamentous but yeastlike cells were also observed there. When dead infected bees were kept in a wet chamber or on wet blotting paper, the mycelium grew through the exoskeleton, and sporangia developed on the outer surface.

In old bees the sporangiospores swelled within the digestive tract but did not germinate. Spores taken from the digestive tract of old bees seven days after inoculation failed to grow when placed on nutrient agar, indicating that they were killed, as spores of **M. hiemalis** ordinarily grew readily on nutrient agar.

Hagem (7) reported that the optimum temperature for growth of **M.** hiemalis on artificial culture medium lies between 20° and 25° C. (68° and 77° F.) while the maximum temperature was established at 33° C. (91.4° F.). The present writer observed in his experiments that growth of this **Mucor** was decidedly more luxuriant at room temperature than at 27° C. (80.6° F.). These observations would apparently indicate that **M. hiemalis** is most virulent for bees at its optimum temperature, and that the normal temperature of the brood nest is above the tolerance of **M. hiemalis.**

The results of these experiments seem to leave little doubt that **M. hiemalis** is pathogenic for young adult bees when they are exposed to a temperature of about 20° C. (68° F.). Although a small percentage (about 1 to 2 per cent) of the young bees used in the experiments may have been naturally infected, it was found that infection was increased to 100 per cent by inoculating the bees. The most virulent form of the fungus appeared to be the chlamydospores from infected bees, but sporangiospores and chlamydospores from cultures were also virulent.

Natural infection of a small percentage of young bees can probably be explained by the fact that **M. hiemalis** is a ubiquitous species constantly present about beehives. Normally the loss of bees due to natural infection by this fungus appears to be of but little importance. When bees are old enough to leave the hive they are no longer susceptible; and young bees almost always remain on the brood combs, where the temperature is several degrees above that at which the fungus can attack them. Should young bees be exposed to temperatures near 20° C. (68° F.), however, some of them might be killed by **Mucor hiemalis.**

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Miss Davison's Recipes

Honey Devil's Food Cake

2 cups flour
1 tsp. soda
½ cup butter
1¼ cups honey
2 eggs unbeaten
6 sq. bitter chocolate
1¼ cups milk
1 tsp. vanilla

Melt chocolate over water bath. Cream butter thoroughly, add honey gradually and cream until light. Add eggs one at a time and beat well. Add melted chocolate and beat well. Sift flour three times, add alternately with milk to first mixture, a small amount at a time, beating after each addition until smooth. Stir in vanilla. Bake in two well buttered or greased ten-inch or three nine-inch layer pans in a moderate oven (325° F.) for 35 minutes. Spread with divinity frosting. Serves 8 to 10.

Eggless and Sugarless Cake

2 tsp. baking powder
½ tsp. soda.
2-1/3 cups flour
1 cup honey
2 tsp. ginger
½ tsp. cloves
½ tsp. salt
4 tablespoons butter
1 cup milk
1 tsp. cinnamon

Melt butter over a water bath. Mix soda and milk and add to honey. Sift remaining dry ingredients three times, add to milk and honey mixture, add melted butter and beat vigorously. Pour into a buttered shallow pan and bake in a moderate oven (350° F.) 30 to 40 minutes. Serves 8 to 10.

Honey Gingerbread

3 tablespoons butter
½ cup sugar
1 egg, beaten
½ cup milk
½ cup honey
1½ cups flour
⅛ tsp. salt
1 tsp. ginger
1 tsp. cinnamon
1 tsp. soda

Cream butter and sugar until light and fluffy, add beaten egg. Sift dry ingredients three times and add alternately with the mixture of milk and honey to the first mixture. Stir thoroughly after each addition. Pour into a well buttered shallow pan and bake in a moderate oven (350° F.) for 40 minutes. Serves 6 to 8.

Nut Gingerbread

To the above recipe add one cup of chopped walnuts to the mixture before pouring into the baking pan and increase baking time to 50 minutes.

Honey Fudge Cake

2 cups cake flour
2 tsp. baking powder
½ tsp. soda
½ cup butter
2 egg whites stiffly beaten
¼ tsp. salt
1 cup honey
2 yolks of eggs, well beaten
2 squares bitter chocolate
1¼ cups milk
1 tsp. vanilla

Melt chocolate over water bath. Cream butter thoroughly, add honey, beat till light. Add egg yolks and melted chocolate. Sift dry ingredients three times and add alternately, with the milk, to the first mixture, beating well after each addition. Add vanilla, then fold in egg whites. Pour into two well greased nine-inch layer pans. Bake in a moderate oven (350° F.) for 35 minutes. Put layers together with Fudge Frosting between layers on top and on sides.

Home Study in North Dakota

This winter the North Dakota Agricultural College offers a larger variety of home study subjects to farm folks of this country than ever before. There are subjects on the list for every member of the family. If the young folks cannot go to high school, business college or college, they can do the next best thing—study at home at a nominal cost.

A practical course in Insects and Insect Control which was developed at the North Dakota Agricultural College this summer should be of interest to every farmer. This subject acquaints the student with the life habits of insects and methods of controlling those which are a menace to mankind, his crops and livestock. Free bulletins are used for a textbook. Twelve lessons constitute the course. Lesson reports after being corrected by specialists are returned to the students. A certificate of completion is awarded upon completion of the course.

Other practical home study courses offered include Beekeeping, Horticulture, Forage Crops, Grains, Poultry, Turkey Raising, Dairying; Sheep, Swine and Beef Cattle Husbandry, Feeding, Farm Buildings, Farm Management, Bookkeeping, Penmanship, Show Card Writing, Business Letter Writing and others.

These subjects are offered as a service to the farm people and not for profits. The only charge made for the practical courses is the average cost of postage and paper used. Upon request the Department of Correspondence Courses, State College Station, Fargo, North Dakota, will send you a free circular describing all its courses.

Book on Bee Diseases

"The Diseases of Bees" is the title of a new paper bound book of 49 pages published by the Apis Club. It can be obtained for 25 cents from the secretary of the club at Brockhill, London Road, Camberley, Surrey, England.

The various diseases are described at length and include the diseases of adult bees as well as the well known brood disorders. Adult diseases described are: acarine, nosema, amoeba, paralysis, May sickness, poisoning and starvation.

An interesting feature of the book is a discussion of "Causes of Needless Anxiety" which describes conditions often mistaken for evidence of disease.

The author's name does not appear which is a source of disappointment to the reviewer. It is assumed that the work is compiled by Miss Betts who is the secretary of the Club and editor of Bee World.

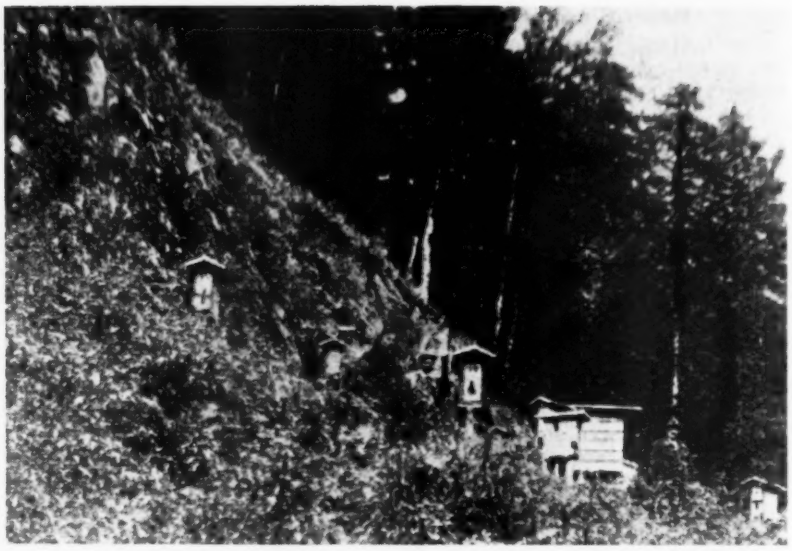
Watt Takes a Partner

A recent visit from Geo. Watt was enjoyable. You will remember him, especially Illinois beekeepers, as the former manager of our apiaries. He is now in Kearney, Nebraska. George stands by one of his tall ones from the season of 1934. In the lower picture, (we'll have to tell you), the young man is not George but Richard Sidwell, his son-in-law, and a partner now in the Platte Valley Apiaries.

Well, that's O.K., George. Keep the business in the family and you will always be able to flog the laggards.

Establishment and Value of Mating Stations

By Erwin C. Alfonsus,
University of Wisconsin.



Mating station in the Bavarian Alps, well protected by slope and forest. Drone colony on right side. (Photo by Die Bayerische Biene.)

Mating station at Straubing, Lower Bavaria. Forest clearing well fenced to avoid disturbance by pedestrians. Drone colony toward the left. (Photo by Die Bayerische Biene.)

IN ORDER to produce a more desirable bee, many attempts to control mating have been undertaken. A domestic animal, according to the definition of some great students of animal husbandry, is an animal whose parents have been selected and have mated under full control of its keeper. This, of course, classes our honeybee as a wild insect, although it has been kept and managed by man for many centuries. Not until the great discovery of instrumental insemination by Dr. L. R. Watson, has full control over honeybee mating in the United States of America been made possible. Watson's method, however, requires enormous skill and necessitates delicate and expensive apparatus. For this reason its performance is limited to experiment stations.

Two other successful attempts to control mating were undertaken in Europe. In the latter part of the past century the German, Dathe, a friend of Frank Benton, exported numerous Italian queens to the U. S. A., which were bred and mated in a locality entirely surrounded by black bees. Dathe took refuge in evening mating. The Italian virgins are allowed to emerge in nuclei which were previously freed of black drones and supplied with selected Italian drones. These mating boxes are kept for several days in a dark, cool place, until the virgin queens reach the mating age (eight to ten days). On a sunny afternoon, between 4:30 and 5 o'clock, the bees in the mating boxes are sprinkled with a luke warm fifty-fifty sugar syrup and transferred outdoors where they are turned to the west so they face the sun. At this time of the evening general drone flight has come to an end. Invigorated by the syrup sprinkle, bees and drones of the mating hive start a beeplay and assume general flight. Soon the virgin will appear, take to wing, and after circling around the hive, disappears from sight to mate with drones from their own nuclei. Sometimes virgins return with the mating sign after their first flight. In the majority of the trials the nuclei had to be returned to dark quarters and mating did not occur until the procedure was repeated four or five times. The writer has used the Dathe method repeatedly with good success. The percentage of virgins lost in the mating attempt was lower than in regular mating in the queen yard. Of the remaining queens, about 82% mated purely. The smaller number of mis-mated queens is due to tardy drones. This type of partially controlled mating does not seem to have any commercial importance because it involves a considerable amount of work and the cost of such queens would be far too high to appear profitable. It opens, however, a resort for breeders of foreign races of bees.

A later, very successful attempt to control mating on a large scale was made about thirty years ago in Switzerland, by founding the so-called "mating station." The first require-

ment for a mating station is a locality entirely free of bees. If such a place, after careful search and consideration, has been located it is necessary to prove its being free of bees. This is done by placing several drone-free nuclei headed by a virgin queen at this place. If the virgins become drone layers then the location is ideal for mating purposes. If one or more of the virgins mate, a careful search for the origin of the drones has to be undertaken. A single virgin for test purposes does not allow a good judgment because for several reasons mating might be prevented. This is a possibility which is minimized if several virgins are used. Sometimes, it is possible, by cooperation of several parties, to clear a locality entirely of other bees. The flight radius of queens and drones is still a discussed question but a bee-free area with a radius of three miles seems sufficient to prevent the interference of outside drones.

At first it seems that the finding of such a place is a hopeless task, but there are such places even if they are hard to find or difficult to prepare. Switzerland, with so many more colonies of bees per square mile than the U. S. A., had in 1913 thirty-nine operating mating stations and in 1926, 125 official and 318 private stations. This would compare to about 500 mating stations in the State of Wisconsin alone. Switzerland, of course, has an advantage in regard to establishing mating stations which other countries lack—its mountains. Bees, housed in a valley, will fly mainly along the bottom of the valley, and on the bordering mountains only to a limited extent. Consequently, it is possible to place a mating station several hundred feet above the flight limits of the valley bees. The winter in mountainous country is usually severe and does not allow a successful wintering of escaped swarms in natural habitats. Mating stations in the mountains are difficult to operate. The mating season in high altitudes is short and the transportation of bees, often performed by long hikes with the bees on the back, means real hardship.

Other opportunities for mating stations offer themselves on islands in lakes or in the sea a few miles remote from the mainland. Coast islands in the sea are usually too windy which results in a high loss of virgin queens.

A clearing in a huge forest frequently offers an ideal outlay for a mating station. Such locations are usually well protected from winds and frequently can be reached by means of a vehicle. If it is a hardwood forest with many hollow trees, a systematic elimination of bee-trees appears necessary to avoid interference from wild drones.

An oasis far enough remote from the edge of the desert seems to offer the finest opportunity for a mating station, but scarcity of honey plants would necessitate continuous feeding.

The beekeepers of a certain district or the members of a beekeepers association keep careful records of the yields and the behavior of each single colony in their apiaries. From their supervised apiary records, the superiority of certain colonies (all of one strain) is easily seen making the selection of queens for the purpose of drone production or queen rearing an easy task. According to Himmer, the breeding aims of the German beekeepers for worker bees are as follows:

1. Highly developed collecting instinct.
2. Speedy comb-building.
3. Hardiness.
4. Longevity.
5. Low swarming propensity.
6. Orderly arrangement of the interior of the hive.
7. Disease resistance.
8. Swiftness in flight.
9. Gentleness.

Queenbees:

1. Prolificness.
2. Compact brood nest.
3. Timely start of brood rearing activities.

Drones cannot be judged on such a basis, but usually pass on the same characteristics as exhibited by their worker sisters. Drones receive their inherited factors solely from their mothers due to their development from unfertilized eggs.

The first step in the population of a mating station is the placing of a highly superior colony early in spring before the rearing of drones has started, thus preventing the drifting in of drones from other colonies before removal. This colony is supplied with one or two frames containing only one-inch starters to allow the construction of abundant drone comb and with it the rearing of many drones. It is advisable to use only nine frames in the drone colony and space them accordingly to allow the bees to draw out the larger drone cells and produce only full sized drones. With ten frames, the spacing of drone combs is not sufficient and results in shorter drones.

Later on in the season, when queen rearing becomes possible, the mating hives with the virgin queens, daughters of selected mothers, are shipped in. They are addressed to the man in charge of the station. The bees in such a nucleus have to be sifted through a queen excluder before shipping to prevent the bringing of outside drones. The nuclei are received, placed and released by the caretaker, who also checks up on the mating and returns the nuclei after the young queens have started to lay eggs or have been lost in the attempt to mate. Such stations really provide for the mating of the "best" with the best. Examinations of mating boxes should not be undertaken between 10 a. m. and 5 p. m., the flight time of queens. Virgins are easily confused and enter the wrong box where they are killed.

Besides Switzerland — Germany and Austria also established mating stations. Such undertakings often meet with great difficulties—sometimes with Governmental forest officials, other times by unexpected mis-matings. In spite of this the number of mating stations increases constantly. The Swiss beekeepers have a director of mating stations, Mr. Juestrich, who regulates business affairs, issues permits for the use of the stations, and checks up on the results of line-breeding. The use of mating stations by beekeepers in Switzerland has increased to such an extent that the 100,000 mark for station-mated queens was passed in 1926. Germany is slightly behind Switzerland, but several stations have been established which operate with more or less success. Some of the experiment stations operate mating stations of their own, such as the Bavarian Institute under the direction of Prof. Zander at Erlangen. Their mating station is situated in an old stone quarry in the center of the Nuernberger Reichswald.

Most numerous are mating stations in the German provinces, Baden and Bavaria. On the northern German sea coast, the experiences with mating stations vary greatly. The station on the island Oie in the Eastern Sea offered perfect possibilities for pure mating being 7.4 miles remote from the mainland. In the case of the Frische Narrows, which are free of bees, the pure mating trials were somewhat disappointing. Twenty-nine nuclei of golden Italian bees of California origin with drone colony were placed in the narrows. Sixty-nine per cent of the golden queens mated with black drones from the mainland five miles away, but did not fall in the water. Ten per cent mated with drones of their own kind while the rest failed to mate or were lost. It has not been determined, whether the black drones from the mainland flew to the narrows or the virgins to the mainland. This shows that a body of water five miles wide is not a hindrance for the mating sexes of the honeybee.

In Switzerland, the native black bee has been used in line-breeding, the same as in Germany. In Germany, however, large districts have been populated with the strain 47 of the Lower-Austrian bee. In both countries they have succeeded in changing the temper of their bees considerably. Their bees are no longer identical with the black bee so familiar to older American beekeepers. Many other traits have also been favorably influenced by selective breeding at mating stations. The productiveness

of their races has been greatly increased. The reports of Juestrich about the yields of 38,000 colonies in eight years may serve as an example. The average yield of the line-bred stocks shows a higher yield of 4.5 kg. per colony. This may seem little to the American beekeeper but their yields per colony seldom exceed 11 kg., which means the line-bred stock produced 41% more honey than the common stocks. Similar results were obtained by Prof. Zander at the Experiment Station in Erlangen. The average yields of four years are tabulated:

Year	Total Average Kg.	Average of line-bred stock Kg.	Higher Yield Kg.	In %
1922	18,220	27,290	9,070	49
1923	9,640	10,850	1,460	15
1924	4,190	9,310	5,220	120
1925	11,900	13,360	1,460	12

1924 was an extremely poor season in southern Germany. However, it proved the superiority of the line-bred stocks best, by showing a 120% higher production.

The results of the European beekeepers with mating stations indicate that all the hardships and difficulties arising from mating station work are well rewarded. In our terms, it would be possible, with a superior race of bees to produce full crops with only two-thirds of the colonies kept before. In poor seasons it would be possible to get at least a small crop instead of a total failure. This, of course, would mean a considerable lowering of the production cost. The increase in hardiness would lower the winter loss in the Northern States and increase fruit pollination in cool spring weather. Gentleness would make handling of bees more of a pleasure and save much trouble with neighbors. These are not mere dreams but possibilities; it has been done and can be repeated.

Crating of Packages

(Continued from page 63)

strips should be used as with the three-cage crate, with the two cages occupying the same positions as cages one and three in the three-cage crate. By this method all crates, whether of two or three cages, may be stacked by the express handlers and still allow plenty of ventilation. When the crating strips are allowed to project 2 inches beyond the end cages, it is impossible to place the side of the cage closer than 2 inches from the side of the express car or from other shipments."

This means that cages will be spaced at least six inches apart in the crate, which will allow ample circulation of air and help to insure the safe arrival of bees at destination, even during periods of high temperature. However, with this increase in the space between packages in the recommended crate it becomes increasingly important that all shippers use the same crating methods.

There has never been a standard crating method for bees. Some shippers space cages four inches apart in the crate, others five inches apart, and a few shippers space the cages six inches apart. When such shipments are stacked together in an express car the ventilation is invariably cut off from some packages. The same thing will be true, as shown in Figure 4, when the three-cage crate with six-inch spacing is stacked with the four-cage crate. The best stacking which the express messenger will be able to do in such cases is shown in Figure 5. However, even with all shippers following the recommendations for crating, there will still remain the condition shown in Figure 6, when two sizes of cages are used. There is less difficulty when the two sizes of cages shown in Figure 1 are used.

If losses of bees during shipment are to be lessened, it seems important that standard methods of crating be adopted by the shippers. While it is probably too much to hope that only one size of cage be used, it is very probable that this would also help in decreasing the amount of loss. There are some indications that cages screened on four sides may be better than cages screened on two sides, especially during periods of high temperature. There are also indications that shipments of bees during June and even early in July may become common. Under such conditions it becomes imperative that all shippers adopt a standard crate and wider spacing of cages within the crate.

Valdosta Highlights

(Continued from page 70)

including honey. By demonstrations and the distribution of recipes, this work is carried on. Last year 10,000 recipe sheets on honey were distributed.

— o —

"American Honey Institute Demonstration," by Malitta Jensen.—A demonstration of foods prepared with southern honey; orange peel, fruit cake, ham, cookies (they were great samples, too).

Suggestions from Mrs. Jensen: Keep a drizzler on the stove. Beekeepers can offer drizzlers for coupons or labels. Demonstrators should get Institute demonstration literature. Say solid or comb honey or liquid honey so the homemaker will understand—**solid honey, liquid honey or comb honey instead of granulated, extracted or section honey.**

Beekeepers owe a debt of gratitude to Mrs. Brandon who helped the Institute in its cookery contest reported elsewhere and in so many ways at this Conference. Thank you, Mrs. Brandon.

— o —

Under the leadership of Fred Muth, over $250 was collected in cash and pledges for the Institute.

— o —

"Honey News Letter," Harold J. Clay, Bureau of Agricultural Economics, U.S.D.A.—This valuable service was not dropped by curtailment of funds thanks to the interest of the industry. It is hoped in the future, that statistics will be available on the queen and package industry which will be valuable to both buyer and shipper.

— o —

"Beekeeping in New York," E. T. Cary, Empire State Honey Producers' Association, A. I. Root Company, Syracuse.—There are still many indifferent beekeepers and sideliners in New York and more different kinds of hives than anywhere else. The Finger Lakes region is probably the largest buckwheat producing area in the United States. **The beekeepers of this area pool their crop and have a sales agency in New York.** The Empire State Association furnished 240 pounds of honey for the Byrd expedition and also furnished honey for the Chicago World's Fair.

— o —

"Top Supering," M. J. Deyell, Gleanings in Bee Culture, Medina.—About package bees, northerners who expect perfect service should be with you folks down here when you ship bees; also the shipper would do well to be with the northern man when he puts in his packages.

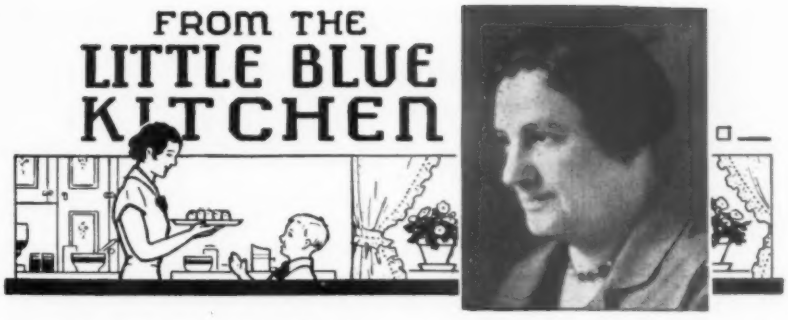
Top supering advantages—easy to determine the needs of the colony, saves labor and time, avoids apiary confusion, does not disturb the hive activity or morale, the combs are better filled, thus saving extracting time.

Objection—carrying distance for honey storage within the hive. In spite of this, it must be remembered bees work up extending gradually and naturally; possibly it would be better for comb building and capping to have the finishing at top position, but top supering takes bees away from the brood nest and avoids congestion and possible swarming. Supers with this system must be given in advance of need and sometimes more than one at a time.

— o —

"The Need for Interstate Bee Disease Control," Dr. Montgomery, Florida.—Burning is the efficient way to handle disease and with it American foulbrood can be eradicated but we cannot prevent reintroduction because of improved transportation between states, and state inter-relations. I suggest that states that do not have proper disease control get a good law, a good service and a good appropriation. Then try to cooperate with states that are working to rid themselves of disease.

(Continued in March Journal)



No doubt most of you who have an "apple barrel" have begun making inroads upon its fragrant contents ere now. Anyway whether you have a barrel, or buy them by the sack. apples come in good in hundreds of ways in winter. Here for instance is a way to use apples with honey. It is called Honey Apples en Casserole, and here's how one makes it:

Pare, core and slice two quarts of apples and put in an earthen or any kind of baking dish. Alternate the apples with layers of crystallized honey; or just pour on the apple layer what you think is sufficient extracted honey to sweeeten the fruit; add a little water, possibly ¼ cup; cover the dish and bake in a moderate oven. At the last a dash of nutmeg or cinnamon on top of the fruit helps the looks and flavor. This may be served either hot or cold with cream. Whipped cream of course makes it even more delicious.

— o —

This recipe for Honey Nut Fudge appealed so to Honey Lady that she tried it out and not finding it "wanting" by any means, passes it on giving due credit to the G. B. Lewis and Kellogg Companies, for the idea.

2 cups sugar
¾ cup milk
½ cup cream
1 square chocolate
¼ cup honey
1 tsp. vanilla
2 tbsp. butter
1 cup nuts

Boil sugar, cream and chocolate for 5 minutes. Add honey and cook until it forms a soft ball in cold water (326° F.). Remove from fire and add the butter and allow to cool to 120° F. Beat until it loses its shiny look. Add vanilla and nuts and pour into a buttered tin. When firm, cut into squares.

— o —

Someone has asked again about the relative quantities of sugar and honey in cooking, and after extensive tryouts Honey Lady feels able to say that while one may substitute honey cupful for cupful, she should on the other hand use 1/5 cupful less of the milk or other liquid which her recipe calls for. This of course is because there is about 1/5 of a cupful of water in each cupful of honey.

Another reader asks if there is any rule by which she can "go" when substituting honey in any given recipe for sugar. That is, a rule deciding where, or not, she **may** so substitute. Honey Lady must honestly reply to this that she does not know of any such rule for it seems possible to use honey in almost any sort of food or drink, where sweetening is required. An "expert" with whom Honey Lady talked recently did say, however, that honey cannot be used in **all** cake mixtures to advantage, as in some of these the cake will "fall." However, in such cakes as have been described in Blue Kitchen, Honey Lady "knows" that honey **will** work successfully.

It is, incidentally, always to be understood by Blue Kitchen readers that recipes therein given have been tried out and NOT "found wanting."

— o —

"Bee" Lines

Remember that old time expression "He made a bee line" for some place? It meant the shortest way, of course. Honey Lady will from time to time give her readers the benefit of little "bee" lines learned when working in Blue Kitchen, for she not only knows that "to save time is to lengthen life," but also that when she **has** knowledge of any good thing its value is doubled by sharing.

Here's Bee Line No. 1! A small muslin or cloth bag with a draw string in its hem, and containing needle, threads, scissors, hooks, eyes, snappers, buttons, etc., and hung under or near the ironing board saves many a minute later on for one can in this way sew up a rip, or put on a hook ,or snapper, "right at the time" and the garment when hung or folded away will be ready for immediate wear. Having the bag always **with** the ironing board provides a "bee line" to these mending aids, saves a trip to another room for them, and very often makes mending on a busy ironing day possible at all!

— o —

Baked Ham With Orange and Honey Flavor

When at a loss for something "different" for the evening meal, or the noon meal, either, for that matter, cut a rather thick slice off a ham. Lay this in a baking dish. Cover it first with slices of orange, sticking cloves into each slice, and then over this pour a mixture of honey and milk, equal proportions of each. Bake for an hour in a moderate oven.

— o —

When desiring to make a specially "scrumptuous" pumpkin pie, (having sweetened the pumpkin with honey instead of cane sugar) do this — "Chill pie thoroughly; then drop upon it big spoonfuls of blent whipped cream honey."

Honey Lady gave Blue Kitchen readers her favorite pumpkin pie recipe some time ago, and can assure them that that recipe insures a wonderful pie.

— o —

It's a bit late, but as Honey Lady didn't have an opportunity to say Happy New Year to Blue Kitchen readers in January, she now sends along the old, old greeting and wishes one and all the happiest new year ever.

Ever present, Malitta F. Jensen, Secretary A.H.I.—"Grand Lady."

Winners in National Honey Cookery Contest

The response was so good that another contest will be held at the time of the next annual convention. In general, the fruit cake entries were better products than the other items. The chocolate cakes were not very good so it was decided to give the remaining two prizes in that section to the fruit cake section since the fruit cakes were so much better.

The entries in Cooky Section Class B were better than those in Class A. Most of the cookies had not been properly protected and were pretty crumbly due to moisture absorbed in transportation. In Class A, fruit cakes, there were 74 entries from 19 states; in Class A, Cooky Section, 45 entries from 18 states; Class B, Chocolate Cakes, 39 entries, 10 states; Class B, Cooky Section, 43 entries, 13 states; Class C, Miscellaneous, 57 entries, from 12 states; total entries, 258 from 24 states.

We give the first, second and third prize winners in all sections as follows:

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Class A—Fruit Cake Section

1st Prize, Entry No. 13—Mrs. E. C. Hackler, Cooks Camp, Valdosta, Ga.

2nd Prize, Entry No. 63—Mrs. Whitfield Ford, Valdosta, Ga.

3rd Prize, Entry No. 3—Miss Carolyn Wendt, Watertown, Wisconsin.

Class A—Cooky Section

1st Prize, Entry No. 60—Mrs. T. W. Burleson, Waxahachie, Texas.

2nd Prize, Entry No. 31—Sisters of St. Benedict, Crookston, Minnesota.

3rd Prize, Entry No. 7—Mrs. Chas. Folk, RFD 4, Bellevue, Ohio.

Class B—Chocolate Cake Section

1st Prize, Entry No. 51 — Mrs. Laura Mason, 1604 N. Ashley St., Valdosta, Ga.

2nd Prize, Entry No. 50—Mrs. T. Burleson, Waxahachie, Texas.

3rd Prize, Entry No. 6—Mrs. Floyd Markham, Ypsilanti, Michigan.

Class B—Cooky Section

1st Prize, Entry No. Ia—Sisters of St. Benedict, Crookston, Minnesota.

2nd Prize, Entry No. 28 — Mrs. Walter Sundberg, Fergus Falls, Minnesota.

3rd Prize, Entry No. 37—Odelia Howell, RFD 3, Franklin, Kentucky.

Class C—Unusual Uses for Honey

1st Prize, Entry No. 5 — Mrs. Wayne N. Smart, 3737 S. 9th St. E., Salt Lake City, Utah.

2nd Prize, Entry No. 17 — Mrs. Floyd Markham, Ypsilanti, Mich.

3rd Prize, Entry No. 20 — Mrs. Lindsay Morris, Huntington, Indiana.

Demuth's "Evolution Beekeeping Practice"

We promised the second part of this interesting article this month. Unfortunately, the press of other items already earlier agreed for February publication and the large amount of space taken by the Valdosta report, make it necessary to delay this and other historical review matter to the March issue.

Death of C. B. Bankston

We learn of the recent death of Mr. C. B. Bankston, of Buffalo, Texas, which occurred on December 10, following an accident in which he was hit by an automobile.

Mr. Bankston is known particularly to our older readers as having been a breeder of bees and queens in Texas for many, many years. He was seventy-two at the time of his death. He had followed a very rich life among the bees, being particularly devoted to his fraternity. At the American Bee Journal office, we had known him for some forty years. Our sympathy goes to the bereaved family and the Texas beekeepers.

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The Southern beekeeper's own magazine, but read by honey-producers everywhere. Combined with the American Bee Journal makes a combination that covers the beekeeping field.

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Untested Queens - - - - - - - -	.75

To remember our address - you are already thinking of bees, for the town Mayhew, an Indian Chief, for the State, the Father of Waters.

BEES, MAYHEW, MISSISSIPPI

Meetings and Events

Beekeepers' School, Madison, Wisconsin, February 4 and 5

Conducted by the Wisconsin State Association and the Department of Entomology of the Wisconsin College of Agriculture. Meetings will be held in the main auditorium, Agricultural Hall, starting Monday, February 4th, with the following program.

"The Farmer's Problems of Management," I. F. Hall; "Strengthening the Farmer's Position," Dean Christensen; address, President A. E. Wolkow, Wisconsin Beekeepers' Association; "What We Can Do This Spring to Insure a Good Honey Crop," Prof. H. F. Wilson; "How to Obtain Good Brood Combs," A. E. Wolkow; "Food Value of Honey," Prof. Schuette; "How to Recognize and Control Foulbrood," C. D. Adams, Inspector; "Experiences in Cleaning Up Foulbrood," by an Inspector. Monday evening, banquet, Wisconsin College of Agriculture.

Tuesday, February 5th, "Demonstration of Requeening and Producing Our Own Queens," Prof. E. C. Alfonsus; "Practical Questions in Beekeeping," a list of questions prepared by Corresponding Secretary, H. J. Rahmlow, of the Wisconsin Association, and answerd by Prof. Wilson, Prof. Alfonsus and beekeepers; "Relieving the Burden of Debt," Gov. Meyers, Washington, D.C., Farm Credit Administration; "Plans to Help Beekeepers in 1935," H. J. Rahmlow; Discussion and Questions, "How We Can Increase Honey Sales Through American Honey Institute;" "Better Honey Marketing," James Gwin, Wisconsin Department of Markets.

A valuable course—Wisconsin beekeepers take note.

New Officers in California

T. L. Nicolaysen was elected president of the California Association at the December convention to retire C. E. Lush, who becomes chairman of the board of managers. President Nicolaysen appointed C. A. Wurth, of Riverside County, to represent the California Association at the convention of farmers and fruit growers and agricultural commissioners meeting in Riverside.

Cook-DuPage (Ill.) Association Meets February 23, at Bismark Hotel, Chicago.

The Cook-DuPage Association will hold its 15th annual business meeting and banquet at the Bismark Hotel, Wells and Randolph Streets, Chicago, February 23, at 2:30 P. M.

Besides the usual business procedure there will be the following program: "Advertising Plans," Mrs.

(Please turn to page 86)

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Beekeepers in this country are increasing their holdings and new beekeepers are establishing themselves along the Great Northern Railway in these states. Diversified farming and live stock are similarly favored by low cost production.

Write for Free Booklet on beekeeping and farming opportunities, including Low Homeseekers' Round Trip Excursion Rates.

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Quality and Personal Service at Marketing Agreement Prices.
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THE EDITOR'S ANSWERS

When stamp is enclosed, the editor will answer questions by mail. Since we have far more questions than we can print in the space available, several months sometimes elapse before answers appear.

STRENGTHENING—TRANSFERRING

I have 10 stands of Italian bees, some good and strong, some weak. How can I strengthen the weak colonies?

In going over the brood chambers I find that the brood comb is crossways and anyway but in the frames. How can I start to get them in good order or in the frames?

I have bought 5 more stands of Italian bees that are about two miles from my home, I would like to transfer them to my home. The bees are in good shape but the gums are old square long gums and in very bad condition. Will you tell me how to move them, and how to transfer them into new 10-frame hives? ALABAMA.

Answer.—(1) You can probably strengthen weak colonies from the strong ones, at this time of the year, in Alabama, but we would be afraid of doing anything with them during the winter in this section of America. Help the weak colonies from the strong ones by giving them brood. But if your combs are crooked, you cannot do it. Then it is best to unite a weak colony to another weak one. It is not a very profitable business. You should change the queens of the worthless colonies.

(2) If your colonies have crooked combs, they need to be transferred. This must be done in spring, when they begin to get something out of the fields. It takes too long to give instructions on transferring, in the question column. But we sell a small pamphlet on transferring bees for 10 cents. You had better send for this and follow its instructions. It will pay you to do it. We don't believe in allowing a single crooked comb in our hives—it does not pay. Keep all your combs straight.

HIVE PAINT

We are told that dark colors absorb heat and that light colors reflect heat, therefore, hives should be painted white, or light.

I am not contradicting this statement, but I would like to inquire if there has ever been actual tests made in the apiary to determine just what difference in temperature there is in hives of different colors.

I would like to repaint all my hives this season and I have thought of painting them something other than the established white. If different beekeepers would adopt different colors, such colors would be marks of identification to property in case it was stolen and that might be something worth while.

Maybe it would not be best to adopt the heavy dark colors like dark red, dark green, etc.; but what about ivory, cream, canary yellow, moss grass or sea green and such light colors. How much difference would these colors make in the temperature of the hive?

Then there is another angle. Barn paint is much cheaper than house paint, but there is no white barn paint. If the lighter barn paints could be used it would amount to a saving without a sacrifice of protection, I think. INDIANA.

Answer.—I do not know whether the test has been actually made between two hives, one painted dark, the other light colored, but it is a well settled fact that dark colors absorb the sun's rays. A hive colored black and one painted white would be altogether different from one another in heat results.

As to painting hives of special colors to identify their ownership, you would need to pass laws compelling beekeepers to adopt a special color. There would not be enough to go around. Besides, each beekeeper wishes to paint his hives in a variety of colors, so as to enable the bees to recognize their home more readily. Your suggestion of cream, canary yellow, sea green, etc., is all right.

As for using barn paint, I suppose you mean iron paint. I don't think you would want your hives painted red, but some white mixed with the red would probably give some acceptable light colors.

Use you judgment and your taste in all this.

CARNIOLAN BEES

Please tell me about the merits and defects of the Carniolan bee compared with the Italian.

I can buy Carniolan-Italian hybrid queens at $1.00 each. Would you prefer these to either, as the Italians are more resistant to the moth and the Carniolan are easier to handle? TEXAS.

Answer.—We prefer the Italians to the Carniolans because they are just as gentle and are more easily distinguished in their mismatings. The Carniolans are so near to the common black bee in color that it is very difficult to notice mismatings.

The worst feature of the Carniolans is their propensity to swarm. This is probably owing to the fact that they keep them in small hives in their native country. They and the Italians are very gentle when properly handled.

HONEY STAND

What would you advise in the building of a honey stand? We intend to spend about $50 for material, and want the most convenient and most attractive stand. We live on the Mount Rainier Highway about twenty miles from Tacoma. Our house, which is new, has already attracted a lot of attention. It is a six-room house and is painted cream trimmed with black and has orange shutters. It is the only one of its kind out this way and is already beginning to be known. Quite frequently cars park somewhere in front and if one watches, one can see the occupants pointing and talking about the house. Please don't think I am writing this in a braggy tone as I really mean only to give you an idea of the house so you may help us with the stand.

Then too, our experience is, that the general public knows very little about bees or beekeeping. We thought if there were display cards and photos to be bought that would help to educate the public it would be a good thing. Photos of brood, swarms, queens, bee yards, handling, etc., could be laid on the counter with a glass over them for the customers to look at while their purchases were being wrapped. Where is it possible for us to get a straw skep to be used for advertising purposes?
WASHINGTON.

Answer.—First, in regard to building a honey stand, if I judge by the account you give me of your home, you do not need advice in the building of a honey stand. As to your suggestion that the general public knows very little about bees, I would suggest that you can have a one-comb observing hive, with glass on both sides. This may be put at one edge of the house with an outlet for the bees to fly. Inquisitive people may then see the bees at work in their home and see the queen lay eggs. For some 15 years, we kept an observing hive every summer on our porch.

As for a straw skep, we have one here, but we do not wish to part with it. You may be able to buy one from some of the old country people who still believe in them.

NORTHERN IOWA PACKING

Do you think a hive packed as follows okay for this part of the country, Cherokee County, Iowa, to winter outdoors?

Take a regular hive body, put insulated board half inch thick all around the outside, then take regular seven-eighths inch lumber and cut dovetail to fit tight on the outside of the insulated board. The hive would now be a little over two inches thick. Make a chaff tray five inches deep to hold the top packing and the bottom board two thicknesses of seven-eighths inch lumber with paper between.

It would cost about thirty-five cents for the insulated board and I could make it two thicknesses instead of one if you think it would need it. IOWA.

Answer.—I believe that the packing of a hive as you suggest is quite sufficient for winter. But if I were located as far north as you are, I would aim to winter my bees in the cellar. A good dry cellar is a good place for bees in a hard winter. I think a single thickness of lumber will do to protect the bees.

INCREASE FROM SWARMING

I am going to do some increasing the coming season from swarming.

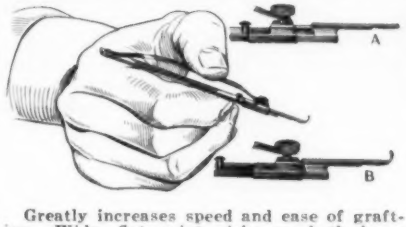
Suppose I purchased queens from some reliable breeder in advance of swarming and when bees swarm I take the old queens and place back into her hive and give the swarm one of the queens that I purchased.

Which would be the better plan, to place swarm on a new stand or to place the parent hive on a new stand and place swarm on the old stand? Which one would give me the most evenly divided strength for each colony?

Would the bees kill queen if I took her out of cage and let her go into hive with the swarm? NEW YORK.

Answer.—It is better to put the swarm on the old stand, if you want to keep the old queen. If you give the old queen to the parent colony and leave it on its stand it will be quite probable, that they will swarm again. But if you put the old colony on a new stand, with the old queen and give the new queen to the swarm, on the old stand, all will probably be well. The new queen must be caged for a few hours at least, as the bees might kill her if you turn her loose at once. At least that is what I would expect. However, we can never tell, for bees are in different moods at the time of swarming.

PIERCE
AUTOMATIC GRAFTING TOOL



Greatly increases speed and ease of grafting. Wide, flat point picks up both larva and food when spring is depressed, automatically dislodging same, in its original position, when spring is released. No priming necessary. Will give years of service. No queen breeder can afford to be without one.

TOOL COMPLETE, $1.50
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See your dealer or write direct.

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The New HAZEL-ATLAS
SKYLINE HONEY JARS
A modern honey jar that combines an up-to-the-minute sales-boosting design with the practical considerations that appeal to the packer; big, smooth label space, wide mouths, heavy bases. Capacities from left to right: one-half pound; one pound; two pound; three pound; and four pound. Write for prices and free sample.
HAZEL-ATLAS GLASS CO.
WHEELING, W. VA.

Our 1935 Package Bees

will not disappoint you. Overweight, select young laying queens, genuine three-banded Italian honey producing stock.

Prompt Shipment

and satisfaction at lowest possible price. Book orders early, no deposit required.

Citronelle Bee Co. *J. T. Haertel Mgr.* **Citronelle, Ala.**

PACKAGE BEES AND QUEENS

For the past nineteen years we have been shipping package bees and queens to all parts of the United States and we know our business. We guarantee to please you with overweight packages and the finest Italian bees.

Health certificate goes with every package of bees and every queen we ship.

We are now booking orders at code prices.

2-Pound Package with Untested Queen	**$2.45**
3-Pound Package with Untested Queen	**3.15**
Queens, Untested	**.75**
Tested	**1.50**

Order now before our booking dates are filled.

HUNT & SONS, GOLDTHWAITE, TEXAS

JENSEN'S
Package Bees and Queens for 1935

Our Pure Three-Banded Italians are gaining in popularity as the years go by. Increased capacity, by the establishment of a more southern queen yard, will enable us to supply the best possible queens with the very earliest packages, or for requeening colonies coming through the winter, queenless.

A prominent authority of Michigan says: "Those fellows up there swear by Jensen's queens." A big producer in California in ordering says: "If you can't fill my order with your own stock, please return my M. O. Don't get queens from your neighbors to fill my order." Another extensive operator has this to say: "Your queens were specified for the reason that your strain has proved superior for comb honey production, and is already dominant in our yards. I have bought queens from many breeders. Uniformity of results is what is being aimed at, and your stuff is being given 'the right of way.'" What would be good in comb honey in Colorado would also be good in extracted anywhere.

In addition to supplying your needs with the very best packages and queens, in any quantity, just when you want them, we are going to help you to help the American Honey Institute popularize honey as no other organization can do.

On all orders of $25.00 or more deduct 1% from the total, and either send direct to the Institute, or to us with your order and we will send it in **to your credit.** This in no wise affects our regular pledge to the Institute, but we feel it is 'as bread cast upon the water.' If the plan helps you, it will also help us. Let's pull together to put honey in its rightful place.

We guarantee: Purely mated, and prolific queens. Full weight of **live bees** at destination. Prompt shipments, and honest efficient **service** that will please you.

Jensen's Apiaries, Crawford, Miss., U. S. A.

3-BAND Italian QUEENS and PACKAGE BEES

I ship overweight packages of young bees on the day you want them.

UNTESTED QUEENS 75c EACH ANY NUMBER.

TWO-POUND PACKAGE BEES $2.45 each with queens any number. $1.70 each without queens.

THREE-POUND PACKAGES $3.15 each with queens any number. $2.40 each without queens.

If bees are wanted shipped by mail add 10c for each package plus postage. Package weight 6 and 7 pounds.

I guarantee queens or bees to reach you alive in good condition.

D. C. JACKSON, FUNSTON, GEORGIA

Meetings and Events

(Continued from page 83)

Irene Duax; "Does the Honey Table Pay?" Mrs. Adam Bodenschatz; "Beekeeping Fables Re-told," C. W. Aeppler; "Beekeeping in Austria and Hungary," Albert Hrankay; "Inspection in Illinois for 1935," C. L. Duax; banquet at 6 o'clock; election and installation of officers, 7:30; "Social Side of Beekeeping," Mrs. Charles Siegle; musical and singing; group singing.

Visitors should make reservations for banquet dinner with the secretary. All beekeepers invited.

Leroy Stockdale, Secretary-Treas.,
Palos Park, Illinois.

California Bee Breeders December Meeting

Closing a two day session December 19th, in the North Sacramento Hotel, North Sacramento, the California State Bee Breeders' Association voted to send a letter to the State Department of Agriculture, protesting the practice of ranchers spraying large areas of fruit trees and produce by airplanes. Poisonous spray dust pumped out of airplanes sometimes drifts two or three miles, injures livestock, honeybees, and so on. Mr. George Triphon, North Sacramento, widely known beekeeper of Solano County, was re-elected president of the association; Thomas Burleson, Colusa, vice-president; J. E. Eckert, Davis, secretary-treasurer; A. M. Hengy, Oroville, and T. S. Nicolaysen, Salida, board of directors.

Communication was also sent to the railroad companies, asking them to provide better ventilation in cars for bee shipments by rail, to reduce losses.

D. G. Sanborn,
California.

Idaho Honey Producers' January Meeting

The Idaho Honey Producers' Association held its annual meeting in the Hotel Boise, at Boise, January 9, 10, and 11. Legislation favorable to the industry was drawn and presented to the state legislature for action. Membership agreed to give a can of honey out of each 500 cans produced, to the American Honey Institute. **[Other associations take note.]**

The Idaho Honey Producers had a fair crop in 1934 and the feeling among the producers is more optimistic than for several years. They realize the great work the Institute is doing for the industry.

Newly elected officers: Jay Redfield, Idaho Falls, president; E. F. Powers, Parma, vice-president; Enier Nelson, Blackfoot, secretary-treasurer. The annual meeting in 1935 will be held at Blackfoot about the middle of November.

Reported by Frank Beach.

ADVERTISING PAGES OMITTED

Crop and Market Report

Compiled by M. G. Dadant.

For our February Crop and Market Report, we asked reporters to answer the following questions:

1. How is honey selling?
2. Any change in prices?
3. How did bees go into winter?
4. Late fall plant conditions?

How Is Crop Moving?

In practically all sections of the country, we find that the honey crop is moving satisfactorily although in many instances there is the usual "January drag" which follows the holidays. However, most beekeepers are entirely satisfied with the way honey is moving and anticipate that there will be a pickup by the time this magazine reaches our readers.

It was surprising the number of instances reported where honey was completely sold out and that beekeepers were having to turn down orders from their customers. This is unfortunate as it would be very much finer if the market could be kept supplied continuously to avoid the possibility of drifting from honey to some other sweet. This is particularly so this season when fruit is so scarce in many of the central western and northern areas.

Sections in which the demand seems to be dragging particularly are in the southern parts of the Central West and in some of the northern intermountain territory. However, such tendency is not sufficient to make any doubt as to the volume. Comb honey has moved very fine and the amount on hand was so negligibly small at the start that there is no doubt that all will be moved shortly.

Lots Left

As stated previously, in many sections there are no lots of honey left and in all sections, those that are held in the hands of beekeepers are in strong hands and are waiting for a better price when the pickup in demand comes a little later in the season. At least this is the anticipation.

Only a few beekeepers themselves reported a considerable quantity on hand with some doubt as to whether they could move it satisfactorily.

Prices

There has been a tendency on the part of beekeepers, of course, to advance their prices somewhat as the amount of honey on hand became more scarce. The usual retail prices, however, have not been advanced out of proportion we believe. The advance has been more in a jobbing way and we find some repercussion on this account from bakers and some other large users of honey to the effect that there may be a reversion back to sugar if honey prices continue to advance as they have during the past few months.

In most instances, the packers and jobbers of honey are not willing to pay a price of more than 7 cents delivered to themselves and on the part of the producers, practically all of the honey which could be delivered at this price has been sold although a few lots could perhaps yet be purchased at a price of 6 cents f.o.b. shipping point which would be right close to the 7 cents delivered.

The usual asking price for carlots not yet sold is from 6 to 6¾ cents with quite a sprinkling of producers asking 7 cents per pound for carloads and anticipating that they will hold until this is received. This would be f.o.b. the producer's station and would mean a price of 8 cents at least f.o.b. the packers or jobbers.

This looks like a very satisfactory price for honey and it is to be hoped that particularly in the baker grade, the price will not range much above 7 cents per pound or we will immediately see a considerable reduction in the amount used for such purposes.

A letter to this effect comes from one big Michigan beekeeper who states that he is selling his crop readily at a price of 7 cents per pound and is not going to advance any higher because he is anxious to keep his trade using honey rather than have it go to some other sweet if the price were advanced to 8 cents per pound. This is a justifiable attitude provided all other costs do not advance out of proportion.

Will Honey Move?

In nearly all sections were reporters unanimous in the statement that all the honey would move readily before a new crop and many of them were sorry that there were not additional lots which could be handled and keep the demand supplied. It certainly looks like the few remaining cars and few remaining large lots in the hands of producers should be able to move satisfactorily at a price which may not be exactly what the producer expects now but at least will be above the average price which has been obtained during the past fall and winter months.

Weather Conditions

Throughout the entire country up to the date this is written (Jan. 20), the weather has been moderately mild so that bees wintered out of doors have had occasional flights. In fact the temperature has been sufficiently high so that in some instances, bees in cellars have been somewhat restless.

There have been quite heavy rainfalls throughout the southern sections except perhaps in Georgia where the rainfall is still deficient.

In the Central Western areas, there has been considerable moisture but not nearly sufficient yet to foster the strong growth of honey plants although undoubtedly the clovers have been very much benefited by the fall and early winter rains.

The Dakotas still seem to be suffering from quite a lot of drouth and this extends perhaps into eastern Montana. However, western Montana and Wyoming are reporting considerable moisture. Colorado seems to be somewhat insufficient.

The rainfall has been sufficiently beneficial in California where rains have been satisfactory if not even excessive. Conditions look better in California for the coming season than they have in many years past according to many reports coming to this office.

All in all, conditions are perhaps normal for the season so far with many less bees going into the spring particularly in the drouth stricken areas. Some beekeepers are anticipating replenishing with package bees but many more will be unable to do so because of finances.

The eastern sections of the country and the Atlantic seaboard seem to be particularly favored and anticipations there are above normal.

In the Canadian provinces, the honey is moving extremely satisfactorily with no doubt but that the entire movement will be consummated before the new crop comes. Moisture has come in the form of snow, making conditions look more favorable for the coming year.

Alberta reports a total crop in 1934 of 1,284,000 pounds, a slight increase in spite of the drouth.

Are You Ready for This Season?
Have you gone over your equipment? Have you plenty supplies? Advertisers in the American Bee Journal will welcome any inquiry sent to them.

Renew Your Subscription
Write for Our Special Club Offers
AMERICAN BEE JOURNAL

Edwin H. Guertin 201 N. Wells St. Chicago
Buy and Sell All Grades Extracted Honey
References: 1st National Bank, R. G. Dun or Bradstreets Commercial Reports.

The BEEKEEPER'S EXCHANGE

Copy for this department must reach us not later than the fifteenth of each month preceding date of issue. If intended for classified department it should be so stated when advertisement is sent.

Rates of advertising in this classified department are seven cents per word, including name and address. Minimum ad, ten words.

As a measure of precaution to our readers, we require references of all new advertisers. To save time, please send the name of your bank and other references with your copy.

Advertisers offering used equipment or bees on combs must guarantee them free from disease, or state exact condition, or furnish certificate of inspection from authorized inspector. Conditions should be stated to insure that buyer is fully informed.

BEES AND QUEENS

ITALIAN Queens. Northern bred, for Northern conditions.
Eugene Gordon, North Platte, Nebraska.

"SHE-SUITS-ME" queens. Prices after May 31, 80c per queen; 6 for $4.50. 12 for $8. Linebred, three-banded stock.
Allen Latham, Norwichtown, Conn.

MOUNTAIN GRAY CAUCASIAN Bees and Queens. Get in touch with us for your 1935 needs. Bolling Bee Co., Bolling, Ala.

THREE-BANDED Italian bees and queens, that are real honey gatherers and gentle to work with, for 1935, at code prices. Satisfaction guaranteed or your money returned. Alamance Bee Company, George Elmo Curtis, Mgr., Graham, North Carolina.

CAUCASIAN QUEENS from my northern hardy, tried stock, ready May 1. Limited number. Order early. Code prices.
Bird's Apiaries, Odebolt, Iowa.

ISLAND BRED dark Italian queens. $5 each. Choicest, $10. Send check or money order. First write Bee Culture, Washington, D.C., for permit to import queens. See ad in Dec. A.B.J. E. L. Sechrist, Papeete, Tahiti.

APRIL 1st SHIPMENT of swarms and queens from my Gulf Coast Bee Co. Apiaries in Louisiana. Guaranteed pure; no disease; live delivery. I know how. I will appreciate your business. Queens, 75c each; two-pound swarms $2.45 each; three-pound swarms, $3.15 each.
Walter T. Kelley Co., Paducah, Kentucky.

FOR SALE—Pure Italian Bees and Queens; nothing but the best. Queens 75 cents each. 1 pound of bees with young queen $1.75. 2 pounds of bees with young queen $2.45. 3 pounds of bees with young queen $3.15. Graydon Bros., Rt. 2, Greenville, Ala.

BEST CAUCASIAN QUEENS AND BEES for April and May delivery. Select queens 75c each. 2-pound package with queen $2.45. 3-pound package with queen $3.15. Booking orders without deposit.
P. B. Skinner Bee Co., Greenville, Ala.

PACKAGE BEES AND QUEENS. Caucasian or Italians reared in separate yards. Finest strain. Each strain is holding old customers and fast making new ones. Each strain will help you make more honey. Lowest code price. Express or Parcel Post shipment. Ready April 1st. Inquiries solicited.
Harrison Apiaries, Honoraville, Ala.

ITALIAN QUEENS 75c. Bees, 2-lb., $2.45; 3-lb., $3.15. Will trade for honey, wax, supplies. Homer W. Richard, ElDorado, Ark.

HONEY FOR SALE

FOR SALE—Northern white extracted and comb honey. M. W. Cousineau, Moorhead, Minn.

HONEY FOR SALE—Keep your customers supplied with honey. We can furnish white and light amber honey at attractive prices. Packed in 60-lb., 10-lb. or 5-lb. tins. Dadant & Sons, Hamilton, Ill.

HONEY FOR SALE—Any kind, any quantity. The John G. Paton Company, 230 Park Avenue, New York.

CHOICE Michigan Clover Honey. New 60's. David Running, Filion, Michigan.

WHITE clover extracted honey. Write for prices and sample.
Kalona Honey Co., Kalona, Iowa.

CHOICE WHITE CLOVER HONEY in 60-lb. cans. J. F. Moore, Tiffin, Ohio.

600 CASES clover basswood comb honey.
Chas. Guhl, R. 7, Napoleon, Ohio.

SEND FOR HONEY PRICES; discount for quantity orders.
H. G. Quirin, Bellevue, Ohio.

FOR SALE—Well ripened clover honey, car lot or local shipments. Will be pleased to submit sample. THE COLORADO HONEY PRODUCERS' ASSN., 1424 Market St., Denver, Colorado.

FINE QUALITY Mangrove honey in new sixties. Sample 6c.
Peter W. Sowinski, Fort Pierce, Florida.

EXTRA WHITE clover-basswood honey in new 60-lb. cans, 7c per lb.; 4 cases or over, 6¾c. A. A. French & Son, Theresa, N. Y.

A LARGE CAR of water white sweet clover alfalfa. Geo. Seastream, Moorhead, Minn.

FINEST CLOVER HONEY priced right.
Riverside Apiaries, Russell, Ill.

CHOICE CLOVER HONEY. Case or car.
Edw. Klein, Gurnee, Ill.

WHITE EXTRACTED HONEY. New cans.
Oakdale Apiaries, Rush City, Minn.

BLACK HILLS—White extracted honey in 60-lb. cans. Samples 25c.
Ernest W. Fox, Fruitdale, S. Dakota.

FOR SALE—400 cases of light amber honey granulated.
C. I. Graham, Gen. Del., Colusa, Calif.

EXTRACTED AND COMB white clover honey. Sample 10c.
F. W. Summerfield, Grand Rapids, Ohio.

HOWDY'S HONEY—Extra fine quality clover extracted, white, in new sixties. Howard Potter, Ithaca, Mich. Personal: 1200 Mass. Ave., Cambridge, Mass.

12,000 LBS. IOWA HONEY. Sample 10c.
Russell Smalley, Grand Junction, Iowa.

FOR SALE—Buckwheat honey in new cans. 5 gallons $3.25. Edward Hogan, 210 Gibson St., Canandaigua, N. Y.

NUMBER ONE COMB HONEY, quantity lots, two-fifty per case.
N. B. Querin & Son, Bellevue, Ohio.

WE OFFER WHITE and amber extracted honey in pails or 60-lb. cans; also comb honey. Reasonable prices. A. I. Root Co., 224 West Huron St., Chicago, Ill.

FOR SALE—Choice extracted clover honey. Write your needs for prices.
Emil J. Baxter, Nauvoo, Ill.

FOR SALE—Choice white clover honey, 60's or 5's. Ralph Hibbard, 131 Benedict St., Watertown, N. Y.

HONEY AND BEESWAX WANTED

WANTED—Car lots honey; also beeswax, any quantity. Mail samples, state quantity and price. Bryant & Cookinham, Inc., Los Angeles, Calif.

WANTED—HONEY and BEESWAX. Beekeepers will find it to their advantage to communicate with us. Please send samples, state quantity available and prices. CALIFORNIA HONEY COMPANY, Hamilton & Company, Agents, 108 W. Sixth Street, Los Angeles, California.

WANTED—Carlots or less of white clover extracted honey. Mail price and sample to Clover Blossom Honey Co., Columbus, O.

WANTED—Extracted Honey. Send sample and price delivered to T. W. Burleson & Son, Waxahachie, Texas.

CASH PAID for carloads and less than carloads all grades extracted honey. Mail samples.
C. W. Aeppler Company, Oconomowoc, Wis.

FOR SALE

FOR SALE—Old-fashioned round straw beehives. G. Korn, Berrien Springs, Michigan.

FOR SALE—500 colonies bees and equipment in A-1 condition.
W. M. Peacock, Mapleton, Iowa.

HIVES, comb and extracting supers, nearly new. Bargain.
Charles Koch, Bourbonnais, Ill.

1000 USED 10-FRAME empty hive bodies, 500 bottoms, covers, excluders. All painted; clean and serviceable. Very cheap.
L. Lieb, Greenacres, Washington.

FOR SALE—40 odd colonies golden Italian bees. No disease. First class 10-frame equipment for 150 colonies A1 condition. Will sell at a great sacrifice.
S. D. Clark, Bayfield, Wis., Box 281.

350 COLONIES bees with best and complete equipment for honey or package bees at a sacrifice. L. L. Ferebee, Pineland, S. C.

FOR SALE—Half interest in 200 acre farm and bees for $2,000.
Write Edward Zajicek, Barnum, Wis.

WANTED

WANTED—50 to 500 colonies bees.
Edw. Klein, Gurnee, Ill.

WANTED—200 colonies of bees; also amber honey. Riverside Apiaries, Russell, Illinois.

EXPERIENCED BEE MAN, 21, wants work with apiarist, orchardist on shares, coming season. Box 147, Johnson, N. Y.

FOR RENT—Location where twenty tons or more of honey can be produced each year.
Julius Boeckh, Cresco, Iowa.

YOUNG MAN wants job with beekeeper; some experience, wants more.
Carl Hansen, Popejoy, Iowa.

WANTED—A large sized extracting outfit.
H. G. Quirin, Bellevue, Ohio.

WANTED — Party with experience and capital to produce twenty tons of honey.
Julius Boeckh, Cresco, Iowa.

WANT TO CORRESPOND with young man with some commercial beekeeping experience for 1935 season in view of taking charge, or bees on share basis after getting familiar with my system.
C. I. Graham, Gen. Del., Colusa, Calif.

WANTED—Bees on crop payment plan. 25 years' experience, comb and extracting. Will accept job.
Bob S. Watson, 125 N. Tyler, ElMonte, Calif.

POSITION WANTED by single man experienced in bees, poultry and some fruit growing, or helper in queen and package business.
Wm. Falk, 126 Linden Ave., Ithaca, N. Y.

I WISH TO TRADE white sweet clover honey and pure bred Saanen milk goats, four and five-quart milkers to freshen soon, for package bees.
Frank A. Zeman, Alliance, Nebr.

WANTED — To correspond with reliable package shipper relative to an exchange of bees for honey.
Write Ohmert Honey Co., Dubuque, Iowa.

SUPPLIES

SAVE MONEY with a Rietsche foundation press. John Stegedirk, Hubbard, Iowa.

BEST QUALITY bee supplies, attractive prices, prompt shipment. Illustrated catalog on request. We take beeswax in trade for bee supplies. The Colorado Honey Producers' Association, Denver, Colo.

ADVERTISING PAGES OMITTED

Honor Roll

AMERICAN HONEY INSTITUTE

EXPLANATIONS ON THE HONOR ROLL—

* indicates those members received through the **Free Queen Offer Made by Stover Apiaries,** Mayhew, Mississippi.

† indicates those members realized through the **Free Queen Offer of S. J. Head,** B. & B. Apiaries, Atchafalaya, Louisiana.

Supporting Members

A. I. Root Company, Medina, Ohio	$ 250.00
Dadant & Sons, Hamilton, Illinois	225.00
W. F. Straub & Company, Chicago, Illinois	187.50
G. B. Lewis Company, Watertown, Wisconsin	152.50
Stover Apiaries, Mayhew, Mississippi	93.75
August Lotz Company, Boyd, Wisconsin	75.00
Superior Honey Company, Ogden, Utah	75.00
A. G. Woodman Company, Grand Rapids, Michigan	54.00
Hazel-Atlas Glass Company, Wheeling, West Virginia	50.00
Jensen Apiaries, Crawford, Mississippi	30.00
M. H. Hunt & Son, Lansing, Michigan	25.00
C. W. Aeppler Company, Oconomowoc, Wisconsin	25.00
W. T. Falconer Mfg. Company, Falconer, New York	25.00
Fred W. Muth Company, Cincinnati, Ohio	25.00
A. I. Root Company, Syracuse, New York	25.00
A. I. Root Company (A. G. Gill), Chicago, Illinois	25.00
A. I. Root Company, Council Bluffs, Iowa	18.75
Owens-Illinois Glass Company, Toledo, Ohio	15.00
Colorado Honey Producers' Ass'n., Denver, Colorado	10.00
Total	$1,386.50

Contributing Members

Alabama

Harrell, W. E., Montgomery	$ 20.00
Running, David, Sumterville	15.00
Knight, Jasper, Hayneville	15.00
Caucasian Apiaries, Brooklyn	10.00
Williams, P. M., Mt. Willing	10.00
Bolling Bee Company, Bolling	10.00
Citronelle Bee Co., Inc., Citronelle	10.00
Holder Apiaries, The, Citronelle	10.00
Short, H. E., Fitzpatrick	10.00
Forehand, W. J. & Sons, Ft. Deposit	10.00
Alabama Apiaries, Mt. Pleasant	10.00
Cutts, J. M. & Son, Montgomery	10.00
Berry, M. C., Montgomery	7.00
Alabama State Bee Ass'n, J. M. Robinson, Auburn	6.00
Smith, N. B. & Co., Ft. Deposit	5.00
Calvert Apiaries, Calvert	5.00
Taylor Apiary, Luverne	5.00
McVay, J. F., Jackson	5.00
Talley, Melvin (Crenshaw Ap.), Rutledge	5.00
Tillery Apiary, Greenville	2.50
Lewis & Tillery Bee Co., Greenville	2.50
Graydon Bros., Greenville	1.00
*McGee, Mrs. F. E., Long Island, Rt. 1, Box 75	1.00
*Merkel, B. L., Sylacauga, Rt. 1	1.00
*Merkel, Roger, Sylacauga	1.00
Total	$187.00

Arizona

Loveitt, M. G., Phoenix, 602 N. 9th Ave.	$ 6.00
Loveitt Honey Company, Phoenix	5.00
Randolph, Mrs. Josephine, Casa Grande, Box 474	4.00
Benson, Niles D., Phoenix, 347 N. 20th Ave.	3.25
Benson, P. H., Palo Verde	3.25
Wedgworth, Leslie, Oracle	1.00
Total	$22.50

California

Brown, Chas. A. (life member) Saugus	$ 20.00
Adamson, Geo., Pomona, Elwood St.	17.20
Kindscher, Logan, Redlands, 937 6th St.	16.33
Lush, C. E., Orange	15.25
Hepner, Jess, Covina	14.25
Heath, Harry, Cypress	10.75
Crawford, L. B., Santa Ana, 311 N. McClay St.	10.00
Krebs, H. M., Sacramento, Dep't of Ag.	10.00
*Smith, Geo. E., Lone Pine	10.00
Shephard, T. H., Calexico	10.00
Weightman, Helen, Los Angeles, 2823 E. 4th	9.90
Woodworth, M. P., Glendora, 217 E. Leodora	9.60
Mayer, Max, Los Angeles, 1726 Santee	8.25
Crawford, H. J., Olive	6.30
Kittinger, Frank, LaVerne	6.00
Wright, Geo. B., San Diego, 348 5th Ave.	6.00
Bryant & Cookinham, Los Angeles	5.00
Vasey, J. W., Miramar	5.00
B-Z-B Honey Company, Alhambra, 1122 Westminister	5.00
Hansen, H. A., Sierra Madre, 150 S. Sierra Madre Ave.	5.00
San Bernardino Honey Prod. Ass'n, Mrs. H. M. Yates, Sec.-Treas., Redlands	5.00
Semon, John S., Sierra Madre	5.00
Reed, Robert H., San Bernardino, Rt. 2, Box 314	4.75
Eckert, J. E., Davis	4.00
St. John, Mark L., Ripon	4.00
Cole, B. B., West	4.00
Clark, Wm. R., Modesto	4.00
Schultz, J. V., Orange, Rt. 1, Box 517	4.00
Edwards, Geo. W., Seeley	3.00
Frank, H., Manteca	3.00
Bettfreund, Geo., Galt, Rt. 2, Box 396	3.00
Mathiesen, J. L., Santa Monica, Star Rt.	1.00
Allen, Lester, San Mateo, 247 N. Claremont	1.00
Marks, Mrs. A. P., Santa Paula, 12th & Venturia	1.00
Tillinghast, J. A., Anaheim, Rt. 3	1.00
Bell, L. B. (Bell Apiaries), Orange	1.00
Carruthers, W. L., Los Angeles, 2124 Keton Ave. W.	1.00
Myers, I. W., Colusa	1.00
*Kolsbun, Robert, Canoga Park, 7239 Shoup	1.00
*Carney, Edward, Campbell	1.00
*Babb, Edwin J., Pasadena, 126 S. Merengo Ave.	1.00
Middleswart, A. E., Onyx	1.00
*Holmberg, W. A., Ripon	1.00
Total	$255.58

Colorado

Caldwell, J. D., Rifle	$20.00
Rice, L. R., Greeley	10.00
Asmussen, Carl, Palisade	5.00
Wadleigh, J. E., LaJunta	5.00
Nielsen, N. C., Center	1.00
Emery, Paul, Greeley	1.00
Carson, Hilda, Littleton	1.00
Smythe, F. R., Sagauche	1.00
*Nease, J. S., Salida	1.00
Total	$45.00

Connecticut

Conn. State Bee Ass'n, C. J. Rost, Sec., Meriden	$25.00
Latham, Allen, Norwichtown	7.00
Walden, P. T., New Haven, 210 St. Ronan St.,	5.00
Cooke, James H., Waterbury, 49 Highland Ave.	1.00
*Scopino, B. C., Terryville	1.00
Total	$39.00

District of Columbia

Burnside, C. E., Washington	$5.00
Total	$5.00

Florida

Lewis, L. M., Havana	$19.00
Strickland, M. O., Sopchoppy	5.00
Moon, E. D., Tallahassee, 833 E. Park Ave.	5.00
*Johnston, J. E., Inverness, Box 306	2.00
*Shuping, P. D., Sharpes	2.00
*Pering, Alfred H., Dade City, Box 123	1.00
*Henley, L. S., Inverness	1.00
*Odlund, Mrs. E. A., Demory Hill	1.00
Harvey, O. P., Tallahassee	1.00
DeLacy, J. T., Havana	1.00
Foster, Robert E., Gainesville	1.00
Cozelian Bee Yard, St. Petersburg, 6465 4th St. S.	1.00
*Malone, Harry F., Orsino	1.00
*Hodges, L. N., Delray Beach, Box 462	1.00
*Callan, Jas. A., Orlando, 642 W. Concord	1.00
Total	$43.00

Georgia

York Bee Company (H. F. York) Jessup	$100.00
Blankenship, Clyde, Helena	5.00
Maddox Commission Co., Bainbridge	5.00
*Spence, J. R., Camilla	3.00
*Wolbert, August, Ellabell	1.00
*Allen, Mrs. L. A., Jonesboro	1.00
*Dennington, T. E., Decatur, 433 S. McDonaugh	1.00
Bellinger, George, Atlanta, 12 Linden St.	1.00
*Sheppard, B. E., Savannah, 1222 E. Henry	1.00
Total	$118.00

Idaho

Epstein, J., Idaho Falls, G. St.	$ 25.00
Mobley, Grover, Rigby	24.00
Miller, Earl J., Blackfoot	18.00
Meyer Bros., Rigby	12.00
Browning, Lee, Rexburg	9.00
Hurst, C. M., Blackfoot	6.00
Nelson, E. M., Blackfoot	6.00
Shore, Arthur, Blackfoot	6.00
Weber, H. B., Blackfoot	6.00
Mitchell, Wm., Shelley	6.00
Bowen, H. R., Roberts	6.00
Mobley, Roy, Rigby	6.00
Miller, Robert E., Twin Falls, 236 5th Ave.	5.00
Randall, Lloyd F., Idaho Falls, G. St.	3.00
Fowler, Heber C., Rexburg, 125 S. 2nd St.	3.00
Cox, O. S., Shelley	3.00
Budge Bros., Malad City	3.00
Nealey, Sam P., Sterling	3.00
Gibson, Wm. T., Rexburg	3.00
Liebert, Wm. E., St. Anthony	3.00
*Sarff, Arthur, Pocatello	1.00
Donaldson, J. L., Nampa, Rt. 3	1.00
Total	$158.00

Illinois

Holm, C., Genoa	$ 14.00
Anderson, C. J., Morris	12.13
Saline-Gallatin Co. Bee Ass'n, Ridgway	5.00
Rocke, R. H., Morton	5.00
Meineke, Ellsworth A., Arlington Heights	5.00
Gill, A. G., Evanston, 2240 Ashbury	5.00
Meier, Edward, Bluffs	3.90
Fisher, Lawrence, Woodson	3.60
Holmes, A. L., Jacksonville	3.60
Duckwall, W. G., Jacksonville	3.60
Vargo, J. J., Granite City	3.60
LaSalle & Bureau Co. Bee Ass'n, R. Entwistle, Sec., LaSalle, 109 4th St.	2.00
Dean, L. A., Big Rock	2.00
Rogers, H. S., Chicago, 8952 Blackstone Ave.	2.00
Lynn, Geo., Lockport	2.00
*Johnson, Alfred, Rankin	2.00
Augenstein, A. A., Dakota	2.00
Laughlin, Harold W., Butler	2.00
Kirk, Wm. S., Farmersville	1.50
Rife, C. A., Naperville, 810 Chicago Ave.	1.50
Strieder, Mr. & Mrs. C. G., Brimfield	1.50
Barcus, O. M., Genoa, Box 165	1.00
Osborn, Wesley, Hillsboro	1.00
*Blake, M. F., Mt. Morris	1.00
*Hassler, Wm. M., Princeton	1.00
*Taylor, Curtis, Mounds	1.00

This Honor Roll occupies several pages and will be continued in the March number. If your state is not included above, therefore, look for it in March or later issues. If any name is mis-spelled or if any name is omitted, please write at once to either the American Bee Journal or to American Honey Institute, Madison, Wisconsin.

THIS SPACE CONTRIBUTED BY DADANT & SONS, HAMILTON, ILL.

The POSTSCRIPT

GOSSIP ABOUT THE OFFICE IN THE MAKING OF THE MAGAZINE

It is a bit surprising to learn that Msgr. Alois J. Klein has had persimmons growing at Brainard, Nebraska, since 1909. I had not known previously of persimmon growing north or west of the one on my Iowa farm. Mine is near the age of these Nebraska trees. Perhaps the persimmon tree is hardier than we had thought. If it can be grown commonly in the Middle West it will prove a real acquisition both for its fruit and for the bees. Are there others in Nebraska or northwest Iowa?

A Nebraska reader inquires whether the bluevine of southern Indiana is a honey plant. The bluevine is a good honey plant but otherwise it is a nuisance. It is spreading westward and is now common in the corn fields of Iowa where it offers a serious problem to the farmer. It belongs to the milkweed family and spreads its seeds far and wide when the pods open and the seeds are released in their silken parachutes. Beekeepers in regions where the bluevine is abundant often get good crops where without it there would be but small harvest. The plant is known by a long list of names, climbing milkweed, sandvine, wild sweet potato and numerous others.

W. T. Clark, of Delphos, Ohio, tells of an interesting experience in requeening by placing cages in supers above the queen excluder. A week later the young queens were found to be released and laying in the supers. The old queens were then removed and the young queens placed below. The occasion was a sudden call which required him to be absent without time to find and remove the old queens. Such introduction is likely to succeed during a honeyflow but during a dearth the result might have been different. I have often requeened by giving a ripe cell in the upper story of the hive above a queen excluder, with a flight hole in the back of the hive to provide for the mating flight.

Stanton Smith, of Zanesville, Ohio, thinks that black locust is over estimated as a source of honey. He says that with thousands of trees growing on all kinds of soil in his vicinity he has known locust honey in the supers only once in ten years. He says that the bloom is valuable for building up colonies but disappointing as a source of surplus.

It seems to me that beekeepers are short sighted to ask for a special tax on bees—as if there were not taxes enough already. The tendency is always to add more taxes rather than to drop any once started. Autoists suggested a tax of one cent per gallon on gasoline to pay for roads. Every year the gas tax is raised until in some states it is now eight cents per gallon and too often the money is used for other things than the roads for which it was intended. A special tax on bees will prove a nuisance to plague the beekeeper far into the future.

One beekeeper writes that he can see no way to stop this special tax idea now that it is started and "politicians see what a wonderful opportunity they have for more tax money." We agree with our correspondent that it is a dangerous precedent to establish.

Ulysses G. Stanley, of Nisbet, Pennsylvania, writes to suggest that it would be a fine thing to have the biographies of the great beekeepers collected and published in book form. I wonder how many beekeepers would be interested in such a book.

In response to the problem of the professional man mentioned in last month's postscript, comes a most interesting letter from Harold I. Perrin, of Sargent, Nebraska. Mr. Perrin took up beekeeping as a sideline to his jewelry business. Beginning in 1922 he has gradually built up from a small beginning and after the first year has put nothing into the business which was not first provided from the sale of its products. He has kept very careful accounts and sends me a detailed list of receipts and expenditures for each year. In the intervening years he has built up equipment for 225 colonies with three full depth supers for each colony, together with power extractor, honey tanks and other essentials. Beside paying for all this equipment, involving a total expenditure of more than $6000, the bees have paid him more than $2700 in cash. To provide a capital investment of this amount with so much cash left over, from such a modest beginning is a showing to be proud of.

Beekeeping thus offers an opportunity that few lines offer to the one who must begin with small outlay. No matter in how small a way one must begin, if he has a good location, he can advance rapidly with capital costs met from returns from the business without outside help. One who has a job which will support him can establish himself in the bee business more readily than in any other business with which I am familiar. At the same time he runs little risk since the bees provide for their own expansion.

At the meeting of the North American Bee Society held at Louisville, December 4, 1873, it is recorded that Doctor Phillips was made an honorary member of the society. His place of residence and reason for the honor are not part of the record. Since that far time was a little early for our present well known Doctor by that name to have appeared upon the scene, it is a matter of curiosity to know something of his predecessor.

Inquiry comes from New York as to whether it be true that buckwheat yields honey only on clay soil. On the contrary, the late J. E. Crane, well known Vermont beekeeper, contended that it yielded best on light or sandy soils and that he knew of but two good crops from buckwheat on clay soils in his locality in sixty years. I would much appreciate further information on this point from beekeepers who are familiar with buckwheat yields.

Many puzzling questions are asked about the behavior of the honey plants. Too often one can only reply as was so characteristic of Doctor Miller, "I don't know." I have before me the question as to whether vetch can be expected to yield much honey on sandy, gravelly soil in Southern Michigan. Vetch is reported as a dependable source of nectar in British Columbia and other localities on the North Pacific Coast, but there is little information at hand as to its behavior in the Mid-West. It is highly desirable to learn more about it. Who knows?

And then I have a letter asking "Who is this James C. Dadant who suddenly bobs up with a good article on smokers?"

"Jimmie" as we call him here, is of the fourth generation in the Dadant line. He was born and still lives in the house once occupied by his great grandfather Charles. He is but recently out of college and after two summers with the bees in the Red River Valley country is getting his bearings here in the office. You will hear more from him.

J. J. Wilder writes that dry weather still prevails in south Georgia with clear blue skies overhead. Because of lack of rain he regards the prospects for a honey crop as none too good. After last year's short crop we are all hoping for a wet season.

Likewise L. A. Syverud writes from Aberdeen, South Dakota, that because of last season's dry weather the sweet clover prospects are slim and he will move his bees to some spot where there has been more rainfall. With all the good rains reported in many places, there still remain plenty of dry spots.

FRANK C. PELLETT.